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Skeptical Inquirer

THE MAGAZINE FOR SCIENCE AND REASON

Vol. 47, No. 5 | September/October 2023

$5.99 CAN/US

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0 09281 02614 3

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The Skeptical Inquirer (ISSN 0194-6730) is published bimonthly by the Center for Inquiry in association with the Committee for Skeptical Inquiry, P.O. Box 703, Amherst, NY 14226. Printed in U.S.A. Periodicals postage paid at Buffalo, NY, and at additional mailing offices. Subscription prices: one year (six issues), $35; two years, $60; three years, $84; single issue, $5.99. Canadian and foreign orders: Payment in U.S. funds drawn on a U.S. bank must accompany orders; please add US$10 per year for shipping. Canadian and foreign customers are encouraged to use Visa or Master Card.

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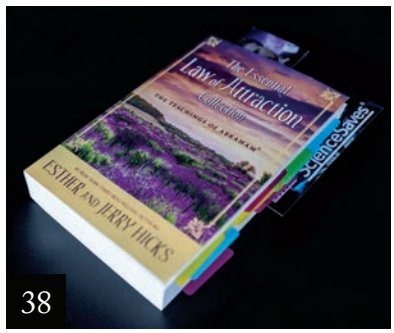

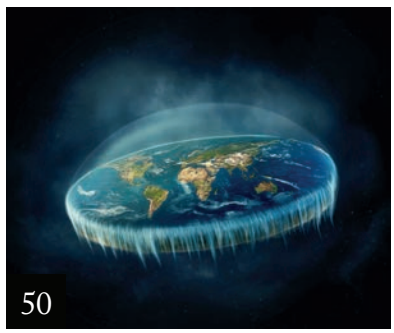

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[FROM THE INTERIM EDITOR

The Insidious Power of Bullshit

Bullshit has undoubtedly been with us from the beginning of civilization, and it shows no sign of disappearing soon. It goes by many names—humbug, poppycock, bollocks, and hokum—but it was not until the American philosopher Harry Frankfurt published an essay, "On Bullshit," that anyone made a clear distinction between bullshit and lying. The essay was published as a small book in 2005 following the George W. Bush vs. John Kerry presidential contest, and it remained on the *New York Times* bestseller list (as *On Bull—*) for twenty-seven weeks.

Frankfurt proposed that liars care very much about the truth and bullshitters don't. Liars believe they know the truth and deliberately say something different in an effort to mislead, whereas bullshitters are not concerned with the truth at all. They only care about influencing their audience. On occasion they may say something that happens to be true, but the veracity of the statement is irrelevant. Bullshitters will say anything to achieve their goals. Importantly, Frankfurt argued that "bullshit is a greater enemy to the truth than lies are" due to the bullshitter's devaluation of objective reality.

Frankfurt's notion of bullshit has stimulated some important psychological research. The 2019 CSICon speaker Gordon Pennycook and colleagues introduced the concept of "pseudo-profound bullshit," which describes many of Deepak Chopra's utterances, as exemplified by this actual tweet: "Attention and intention are the mechanics of manifestation." Pennycook finds that some people are more susceptible to pseudo-profound bullshit than others, and this characteristic is related to other important traits.

Our cover story is by one of the most prolific researchers of bullshit today, John V. Petrocelli—Wake Forest University psychologist, author of the 2021 book *The Life-Changing Science of Detecting Bullshit*, and 2022 CSICon speaker. His article, "Persuasive Bullshitters and the Insidious Bullshit Hypothesis," which is based on that CSICon talk, helps to explain why bullshit is so convincing—under some circumstances even more convincing than truth or lies. Given the sheer volume of bullshit in modern life, this kind of research is going to be needed for some time.

Sadly, just as this issue was going to print, we received news that the philosopher Harry Frankfurt had died on July 16, 2023, at the age of ninety-four. Some of his earliest and most important philosophical work was on free will, identity, and love. But among the general public, he will most often be remembered for "On Bullshit."

Finally, this is my last note as interim editor of Skeptical Inquirer. Stephen Hupp has accepted the position of permanent editor, and I can think of no more capable person to carry on the legacy of Kendrick Frazier and guide the world's foremost magazine for science and reason. I will now return to my usual spot as consulting editor and author of the "Behavior & Belief" column. In the meantime, it has been one of the great honors of my life to occupy the editor's chair during this period of transition.

—Stuart Vyse

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The 'Ghost Bird' Returns—or Not

Benjamin Radford

The curious case of the ivory-billed woodpecker's existence remains open despite decades of dedicated research. The last widely accepted sighting of *Campephilus principalis* in North America was in 1944. Unverified reports have continued—some 200 since then—from bird enthusiasts, game wardens, and ornithologists, yielding several photographs and videos. While not as frustratingly ambiguous as the plague of plentiful "blobsquatches" claimed to be Bigfoot, they nevertheless failed to settle the matter.

A chance sighting in Arkansas's Cache River National Wildlife Refuge of a presumed extinct woodpecker led to a 2005 scientific expedition that seemingly confirmed that the birds still live. A blurry video clip showed the bird's distinctive size and markings. "The bird captured on video is clearly an ivory-billed woodpecker. Amazingly, America may have another chance to protect the future of this spectacular bird and the awesome forests in which it lives," John Fitzpatrick, director of the Cornell Laboratory of Ornithology, said at the time. The discovery spawned international headlines and an article in the journal *Science* (see "Rare Woodpecker, Presumed Extinct, Found in Arkansas," Skeptical Inquirer, March/April 2006).

Yet after nearly two decades of searching, the ivory-billed woodpecker's existence remains unproven. Not a single bird has been found. A discovery once touted worldwide as a hopeful environmental miracle turned into a complex and fascinating tale of environmentalism, anecdotal evidence, and scientific debate. (For more on this, see the 2009 documentary film *Ghost Bird* and Geoffrey E. Hill's book *Ivorybill Hunters: The Search for Proof in a Flooded Wilderness* [Oxford University Press, 2007].)

New research by Steven C. Latta et al. published May 18 in the open-access, peer-reviewed journal *Ecology and Evolution* revisits the controversy. The team analyzed evidence collected over a decade (2012 to 2022) from eyewitness reports, drone footage, acoustic recordings, trail cameras, and more. Over a half million hours of footage were reviewed. The researchers concluded:

> Repeated observations by reliable observers, and suggestive audio, support the possible presence of the Ivory-billed Woodpecker. The appearance in trail camera photographs and drone videos of woodpeckers with characteristics consistent with those of an Ivory-billed Woodpecker is also suggestive. … We conclude that multiple lines of compelling evidence suggest that Ivory-billed Woodpeckers persist in our Louisiana study site. Cumulatively, our visual observations, audio files, trail camera photographs, and drone videos, suggest the intermittent but repeated presence of multiple individual birds with field marks and behaviors consistent with those of Ivory-billed Woodpeckers.

The study has implications that go beyond this woodpecker, of course. Similar claims have been made about the thylacine, also known as the Tasmanian tiger. It looked something like a large striped dog with an oversized mouth. The last known thylacine died in a zoo in the Tasmanian capital of Hobart on September 7, 1936; rumor has it his name was Ben. Still, people occasionally see and report them to this day. Like Bigfoot or the Loch Ness monster, there remain a handful of believers who think thylacines still exist, though on the verge of extinction. Some people in Tasmania regard stories of an existing thylacine the way they would reports of Bigfoot or unicorns: tall tales and pipe dreams that draw deluded and gullible searchers. Others are less sanguine and believe that there must be a creature out there somewhere.

The possible, tantalizing rediscovery of the woodpecker was trumpeted by cryptozoologists as proof that animals thought long extinct may still exist. This logic is extended to suggest that mysterious creatures such as Bigfoot may also remain to be found. Yet there is a huge difference between a population of tens of thousands of giant manlike creatures for which no hard evidence exists and finding a surviving member of a relatively small species long known to exist, such as this woodpecker or the coelacanth.

The ivory-billed woodpecker investigation, however, is almost as interesting for what it did *not* find: Bigfoot. The search for the woodpecker involved decades of investigation, including many months of intensive field research in the woods of rural Arkansas. One common response to why Bigfoot evidence is so sparse is that few people are out actively looking or listening. Here is a perfect counterexample: knowledgeable researchers with sophisticated equipment in the field for extended periods of time. Arkansas is well-known as Bigfoot territory and even touts one famous local creature, the Fouke Monster (there are other mysterious monsters said to roam the area as well, including Dogmen).

Yet no reports of unidentified creatures or vocalizations emerged from the team's voluminous recordings and observations. That they were not specifically looking for Bigfoot is irrelevant; new discoveries often occur when searchers are looking for one quarry but find others. Surely so many trained eyes and ears, with so much equipment, could not have failed to notice hairy manlike giants living in and roaming through the woods.

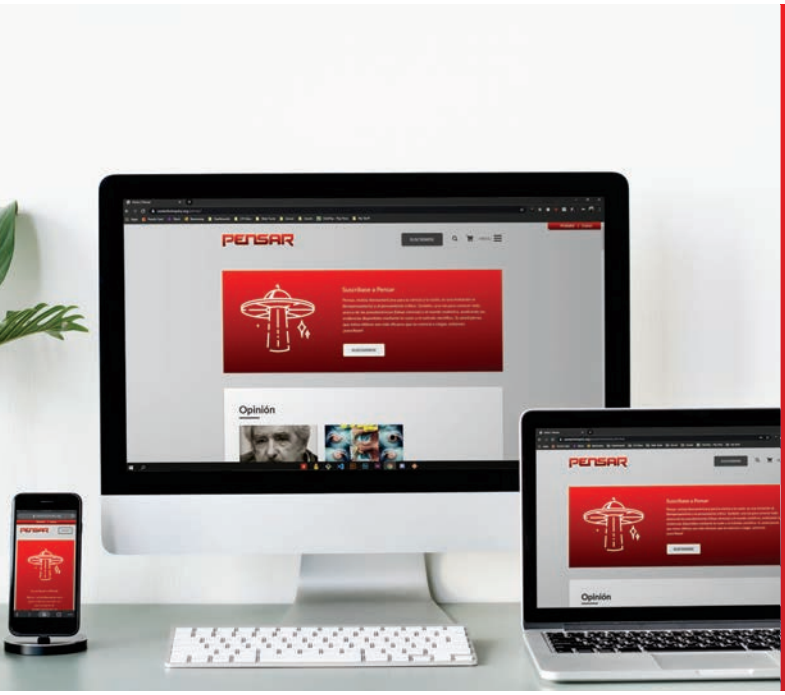
In the winter of 2005, Cornell scientists and researchers renewed the search, scouring thousands of acres using global positioning system equipment, binoculars, digital video cameras, and cell phones. Tree-mounted digital cameras capable of taking photos every twelve seconds include all the gizmos a zoologist could want, including time lapse, motion detection, infrared, and high-definition. High-tech, multidirectional audio units able to record sounds up to 200 meters away should be suitable for capturing both distinctive woodpecker taps and the oft-reported (but never verified) Bigfoot vocalizations.

Surely such a sustained, well-equipped scientific effort in an area famous for Bigfoot sightings should have—but notably did not—yield some evidence for whatever elusive creatures may lurk in the Arkansas woods. Of course, though no evidence of Bigfoot was found, it did not deter believers. But it did remove the excuse that no sustained, well-equipped search teams have spent long periods of time deep in Bigfoot territory. Cryptozoology aside, conservationists and ornithologists can take heart that there's (maybe) good evidence that (at least some) ivory bills are (probably) still around. ■

Reference

Latta, Steven, Mark Michaels, Thomas Michot, et al. 2023. Multiple lines of evidence suggest the persistence of the ivory-billed woodpecker (*Campephilus principalis*) in Louisiana. *Ecology and Evolution* 13: e10017. Online at https://doi.org/10.1002/ece3.10017.

Benjamin Radford is the deputy editor of the Skeptical Inquirer.



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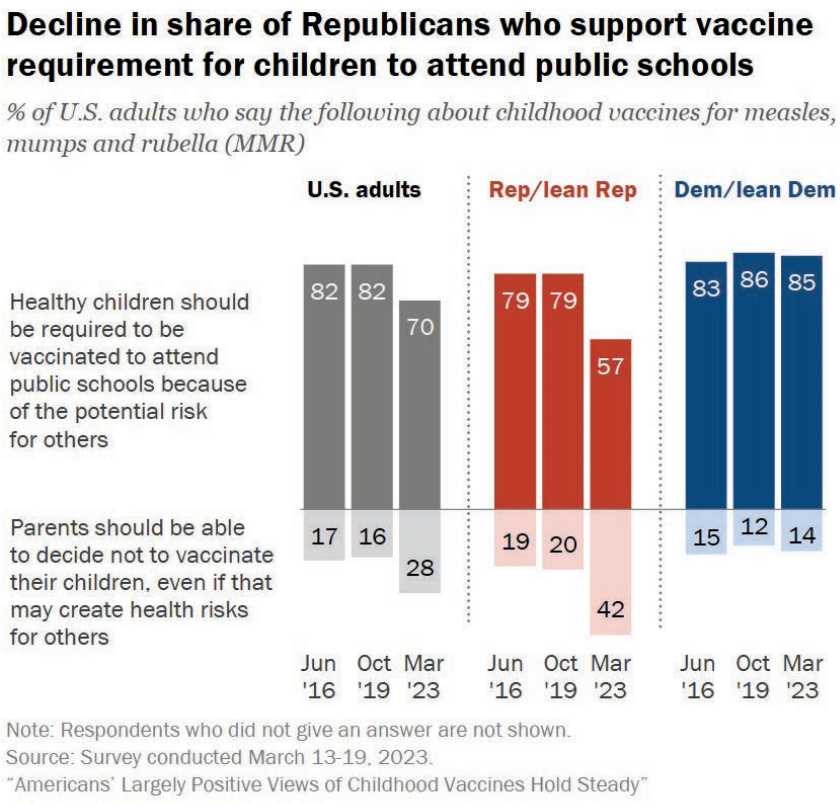
Confidence in MMR Vaccines Remains High—but Lower among Parents, Republicans

Stuart Vyse


Decline in share of Republicans who support vaccine requirement for children to attend public schools
% of U.S. adults who say the following about childhood vaccines for measles, mumps and rubella (MMR)
U.S. adults
Rep/lean Rep
Dem/lean Dem
Healthy children should be required to be vaccinated to attend public schools because of the potential risk for others
Parents should be able to decide not to vaccinate their children, even if that may create health risks for others
82 82 70
17 16 28
79 79 57
19 20 42
83 86 85
15 12 14
Jun '16 Oct '19 Mar '23
Jun '16 Oct '19 Mar '23
Jun '16 Oct '19 Mar '23
Note: Respondents who did not give an answer are not shown.
Source: Survey conducted March 13-19, 2023.
"Americans' Largely Positive Views of Childhood Vaccines Hold Steady"
PEW RESEARCH CENTER

A Pew Research poll conducted in March 2023 showed that, among the general population of American adults, confidence in childhood MMR vaccines remains high and steady. Eighty-eight percent of respondents said the benefits outweigh risks, with 10 percent reporting the opposite view. This result was the same as what Pew obtained in June 2016 and October 2019.

These are encouraging findings given the pre-pandemic history of false claims about childhood vaccines. Most notable was the 1998 publication of Andrew Wakefield's falsified study in the British medical journal *The Lancet* claiming to show that the MMR vaccine caused autism. The study was eventually retracted, and Wakefield lost his medical license because of this episode. Nonetheless, following the publication of the *Lancet* study, the United Kingdom experienced a decline in vaccination rates to below 80 percent, and measles cases in the United Kingdom jumped from fifty-six in 1998 to 1,348 in 2008, with two confirmed deaths (Thomas 2010).

Vaccines became highly politicized during the COVID-19 pandemic, and a less favorable outcome of the Pew study appeared to show that by spring 2023 vaccine resistance among Republicans had spread from COVID-19 vaccines to the MMR vaccines, specifically the question of whether to require them for admission to schools. Through all three time periods of the survey, over 80 percent of Democrats supported requiring children to be vaccinated before attending public school, but Republican support for this policy declined substantially from approximately 79 percent in the previous two rounds to 57 percent in 2023. Furthermore, endorsement of the alternative statement "Parents should be able to decide not to vaccinate their children, even if that may create health risks for others," which had been at approximately 15 percent among Democrats and 20 percent among Republicans, more than doubled among Republicans in 2023.

In addition, parents—those who are closest to the issue of childhood vaccination—showed a slightly higher degree of vaccine hesitancy than other adults in the March 2023 poll. Only 38 percent of adults without children under eighteen endorsed the statement "I worry that not all childhood vaccines are necessary," but this view was endorsed by 48 percent of parents whose youngest child was between five and seventeen and by a slim majority (51 percent) of parents whose youngest child was younger than four years old.

Finally, when put together in a head-to-head comparison, MMR vaccines fared much better than COVID-19 vaccines. In the March 2023 survey, 88 percent of respondents said the benefits of MMR vaccines outweighed the risks, but that view dropped to 62 percent for COVID-19 vaccines. Pew's conclusion was: "The survey findings highlight the sizable gap between higher public confidence in childhood vaccines and lower ratings of COVID-19 vaccines." ■

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New Software for Center for Inquiry Libraries

The Center for Inquiry Libraries (www.CFILibraries.org) is announcing a change in its library management system. The old system, Cybertools for Libraries, is slowly being phased out, so CFI Libraries Director Timothy Binga began a search for a new system in September 2022. "Cybertools was a great fit for our libraries' needs. The owners of Cybertools are very supportive of our organization, and we thank them for their years of service and support," Binga said. "We looked at many different software packages and Integrated Library Management Systems and decided on Know All Matrix created by Bailey Solutions, headquartered in East Sussex, England."

The system became fully operational at the end of May 2023, and training began immediately. "There are many features that will be introduced as we learn more about them," stated Binga. There will be the ability to save searches in an account, if you choose to create one, and to search using the typical access points, such as subject, author, title, etc., in addition to tags created by others. "This will give researchers an opportunity to find something that was tagged in a way traditional library cataloging does not, thus making it more easily found." The CFI Libraries will also be adding links directly to some research resources that were never added to the previous system. ■

Merit in Science Defended

William M. London

Is modern science being compromised by a deemphasis on merit in favor of adherence to progressive orthodoxies? A commentary paper, "In Defense of Merit," authored by twenty-nine scholars with a range of expertise within the natural and social sciences, mathematics, and philosophy, argues the answer is yes.

Perhaps the lack of interest in the subject matter of the paper by several journal editors shows that the authors might have a point. As noted at indefenseofmerit.org, when the authors attempted to publish their paper in *Proceedings of the National Academy of Sciences* (*PNAS*) as a counterpoint to several perspectives the journal had published, the response was that "merit" did not belong in the title. The *PNAS* editorial board declared, "This concept of merit, as the authors surely know, has been widely and legitimately attacked as hollow." I guess the editorial board members don't appreciate merit in the distinguished careers of the paper's authors, among them two Nobel laureates. Two of the authors were Jerry A. Coyne and Luana S. Maroja, who wrote the July/August 2023 SI cover story, "The Ideological Subversion of Biology."

A version of the paper noting "not only is meritocracy in science a controversial idea, in some circles the very existence of merit as a concept is questioned" was submitted to the open-access *Journal of Controversial Ideas*, where its twenty-six pages were published on April 28, 2023, after undergoing the journal's careful editorial and peer-review process. According to its website, the journal was "created to promote free inquiry on controversial topics" and is "a forum for careful, rigorous, unpolemical discussion of issues that are widely considered controversial, in the sense that certain views about them might be regarded by many people as morally, socially, or ideologically objectionable or offensive."

The authors argue that the merit-based science now in need of defense is based on the epistemology of the liberal Enlightenment and humanism consisting of ideas including: (1) provisional truth is attainable; (2) fallibilism—anyone can be wrong; (3) objectivity—a rejection of any theory that cannot be proven or disproven by reality; (4) accountability—the openness to conceding and correcting errors; and (5) pluralism—the maintenance of intellectual diversity to maximize the chances of finding the truth.

They argue that merit-based science needs to be defended against identity-based ideologies based on postmodernism and critical social justice (CSJ) principles. They reject the idea that truth should or can be determined by the group-based identities of the claimant. In contrast to liberal epistemology, they describe CSJ epistemology as characterized by: (1) denial of the existence of objective reality; (2) replacing the concept of truth by "multiple narratives" and "alternative ways of knowing;" (3) stating that claims to truth are merely claims to power; (4) considering lived experience and subjectivism as the basis of knowledge; (5) rejecting that a theory can be proven or disproven by the

empirical process; (6) denying the legitimacy of other viewpoints; and (7) not admitting corrections from outside.

They describe three themes in statements by scientific societies and prominent scientific journals advancing CSJ ideology and attacking science and liberal epistemology: (1) science is white and colonial; (2) science is racist; and (3) merit-based policies should be replaced by identity-based policies.

Only a few of the numerous examples in the paper can be provided in this space.

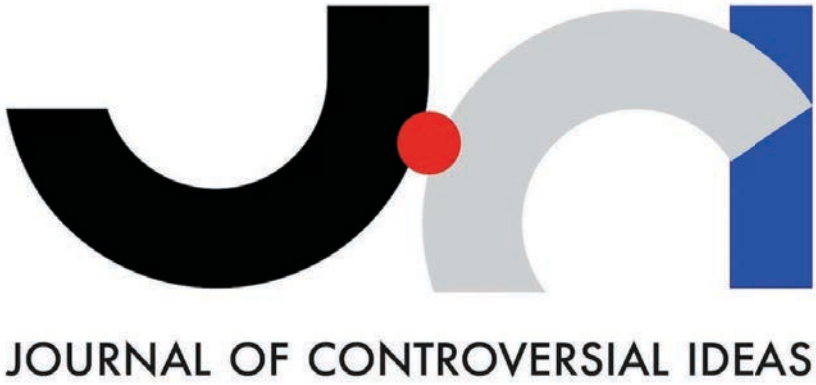
In New Zealand, the indigenous mythological content of Mātauranga Māori has been added to the science curriculum. It is now actively pursued throughout schools and universities with government support. Criticisms are dismissed as racist.

A 2023 report on "Advancing Antiracism, Diversity, Equity, and Inclusion in STEMM Organizations" by the National Academies of Sciences, Engineering, and Medicine describes merit as a nonobjective "culturally construed" concept used to hide bias and perpetuate privilege, refers to objectivity and meritocracy in STEMM as myths, and calls for merit-based metrics of evaluation to be dismantled.

In 2021, a paper by Marcia McNutt, president of the National Academy of Sciences, and Laura Castillo-Page, chief diversity and inclusion officer at the National Academies of Sciences, Engineering, and Medicine, included:

> Not so long ago, the NAS might have naively argued that its membership could not reflect the diversity of the American public it serves until universities fixed the "leaky pipeline" of too many women opting out of careers in scientific research almost before they begin, or until elementary and secondary schools started motivating more students of color to study STEMM disciplines and prepared them for success in college and beyond. But in 2021, it is simply not acceptable to wait for "bottom-up" solutions.

Thus, proportional representation trumps merit according to the statement, published in *Nature Medicine*.



A twenty-seven-page supplemental information paper can be downloaded via a link provided at the end of "In Defense of Merit." It provides examples of "the particular vein of postmodern and critical theory thought that rejects science, reason, etc.," and the absurd extent to which "CSJ 'problematizes' things in order to, supposedly, reveal the depths of white supremacy, Euro-colonial hegemony, patriarchy, etc." In contrast, the supplement also provides examples of: (1) the kind of feminist scholarship that embraces objectivity, empiricism, science, and robust discourse as part of truth-seeking; and (2) how hiring can be both merit-based and equitable with alertness to potential bias. The supplement ends with biographical profiles of each of the authors.

The merit paper's suggestions for depoliticizing science and strengthening merit-based practices include:

- Insist that government funding for research be distributed solely on the basis of merit;
- Ensure that academic departments and conferences select speakers based on scientific, rather than ideological, considerations;
- Ensure that admissions, hiring, and promotion are merit-based and free from ideological tests;
- Publish and retract scientific papers on the basis of scientific, not ideological, arguments or due to public pressure;
- Require that universities enforce policies protecting academic freedom and freedom of expression, according to best practices promulgated by nonpartisan free speech and academic freedom organizations, such as the Foundation for Individual Rights and Expression; and
- Insist that university departments and professional societies refrain from issuing statements on social and political issues not relevant to their functioning, as recommended in the University of Chicago's Kalven Report. ■

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Ads for Nonprofit and Government Organizations Found on Misinformation-Promoting Websites

William M. London

Analysts for the media misinformation watchdog organization NewsGuard have reported that, in April and May 2023, they identified 108 digital ads from fifty-seven nonprofit and government organizations on fifty websites that had spread misinformation. The ads were hyper-targeted to specific demographic groups and, in some cases, were adjacent to articles containing false or misleading content.

Multiple health organizations and U.S. colleges and universities were found advertising on sites "trafficking in blatant and at times dangerous health misinformation, including false claims about the dangers of COVID-19 vaccines and bogus health remedies." NewsGuard analysts identified forty-seven ads for humanitarian and relief organizations that appeared on websites promoting Russian misinformation about its war on Ukraine. NewsGuard's special May 12, 2023, report to the European Commission ("Do-Gooders Doing Bad: How Nonprofit and Government Organizations Unintentionally Fund the Misinformation Machine" by Jack Brewster and Macrina Wang) discussed fourteen of the nonprofit and government organizations with ads that appeared on misinformation sites. Here are some examples:

- Ads for Planned Parenthood and Girl Scouts of the USA were found next to an article published on misinformation-promoting ReturnToNow.net titled "Planned Parenthood—The Natural Way," which promoted dangerous herbal abortion recipes actually discouraged by Planned Parenthood.
- An ad for Doctors Without Borders, an international organization that provides medical assistance to people affected by conflict, including the Russia–Ukraine war, appeared on ControInformazione.info, an Italian news site that has published false claims and conspiracy theories about the COVID-19 pandemic and the Russia–Ukraine war.
- An Alzheimer's Association ad accompanied a May 2022 article on DailyHealthPost.com that advanced the unsubstantiated claim that fluoride is "associated with an increased incidence of Alzheimer's."
- Ads for Purdue University and Franklin University appeared in an article published in March 2020 on DailyHealthPost.com that falsely claimed that an "alkaline diet" of non-acidic fruits and vegetables can change the body's pH level and lower the risk of developing serious health issues.
- An ad for the city of New Haven's vaccination program appeared in an August 2022 article on RaffaelePalermoNews.com that falsely claimed that COVID-19 vaccines contain toxic spike proteins.
- An ad promoting a three-day cancer research event by the New York Academy of Sciences, which highlights "Science for the Public Good" in the title of its mission statement, appeared in a Healthy-Holistic-Living.com article promoting the baseless claim that green tea can "kill cancer stem cells."

The report notes that many, if not all, of the organizations advertising on these websites were likely unaware they are funding websites that spread misinformation because the ads are purchased on digital-advertising platforms such as Google and The Trade Desk through ad agencies. Some of the ads were placed on misinformation websites by the nonprofit Ad Council, which produces public service announcements.

Five of the fourteen organizations named in the report responded to inquiries by NewsGuard. Two indicated they would put the misinformation sites where their ads appeared on their exclusion lists. One said it would investigate the matter, and another wouldn't comment. The American Red Cross responded that a screenshot of one of the ads for the organization that appeared on English.Pravda.ru did not look like an ad it purchased from its media agency.

NewsGuard's report states that it's difficult to estimate how much money nonprofit and government organizations are spending on advertising on misinformation-promoting websites. I hope that organizations will come to recognize that any such spending is too much. For more on this topic, see the special report "The Hypocrisy of Medical Disinformation: A Report from Hungary" by Nóra Falyuna and Péter Krekó, which appeared in the May/June 2023 SI. ■

A version of this news brief previously appeared in Quackwatch's Consumer Health Digest *newsletter.*

William M. London is a professor of public health at Cal State LA and the editor of the free weekly email newsletter *Consumer Health Digest* published by the Center for Inquiry's Quackwatch. He writes a Consumer Health column at skepticalinquirer.org. He refers to himself as a consumer advocate.

Three Vie for Skeptics Prize

JAMES UNDERDOWN

Between May 20, 2023, and May 24, 2023, the Center for Inquiry Investigations Group (CFIIG) tested three applicants to our $500,000 Paranormal Challenge. We've been conducting tests since 2000 for various amounts of money. (Our first prize was $5,000 and was underwritten out of our own pockets.) What made that week unique was that so many were tested in such a short time, and all three tests were completely different—different claims, different protocols, different people. I asked Jeff Wagg, who ran the Million Dollar Challenge for James Randi, if they'd ever had such a week. He said they once tested a bunch of dowsers in Australia on the same day, but that it was one test. Wagg said three distinct tests in five days might be a record.

The First Responders team within the CFIIG normally fields between 100 and 200 applications per year of people who claim to possess paranormal abilities. Only about 5 percent of the applicants make it to an actual test. We think that's because people who are less sure of their abilities or who plan to cheat probably drop out when they learn about the rigorous nature of the testing process. Prior to any test, we typically have substantial contact with each applicant and enter into a negotiation. Some of the common issues involve narrowing their claims to something testable, explaining the Challenge rules, and working out a specific protocol that the applicant and the CFIIG can both agree on. All applicants are told to try their test at home first and not spend any of the prize money ahead of time!

We take great measures to prevent anyone from winning through trickery, luck, or sloppy test design. The $500,000 Challenge is conducted in two parts, which is a safeguard against someone winning by luck alone. When odds can be assigned to the probability of passing a test, we aim for 5,000:1 for the Preliminary Demonstration and 1,000,000:1 for the Final Test. Those overall one-in-five-billion odds against winning both tests by luck are high enough to risk CFI's money. The applicants who've been tested—so far—have been 100 percent sincere in the belief in their own superpowers. One hundred percent is also their failure rate, by the way. No one has even passed a Preliminary Demonstration.

Here is a short summary of these three tests. I'll keep the applicants' full names out of the descriptions. Maybe someday they'll see the folly of their beliefs and appreciate this bit of anonymity.

Test 1 – 5/20/23 – Failed Attempt

José is a forty-year-old man from Spain who claimed to be able to hypnotize from a distance—and make someone's eyes roll back into their head. This was originally supposed to happen over a Zoom call during our April 15, 2023, CFIIG meeting.

We had two Spanish interpreters on hand, but there were some technical difficulties with the audio on his end, and the test did not go smoothly. He was not able to control any of our eyeballs that day, but to be fair, we allowed him a retry at the next meeting on May 20. We also allowed him to change his task to making one or more of us (involuntarily) raise his or her arms in the air. Normally, changes in protocol midstream would not be permitted, but the choppy audio was not his fault. In addition, arm-raising was easier for us to see over Zoom, so we allowed it.

On May 20 before José joined the call, I queried the CFIIG members to see if anyone would like to be part of the test and asked the volunteers if anyone had ever tried to hypnotize them. Some people *can* be hypnotized, and we didn't want anyone too suggestable to participate. We usually don't have CFIIG members take part in the tests as subjects, but José claimed to be able to do this to *anyone*, even skeptics. Naturally, outsiders or people of his choosing could not be trusted for this specific test.

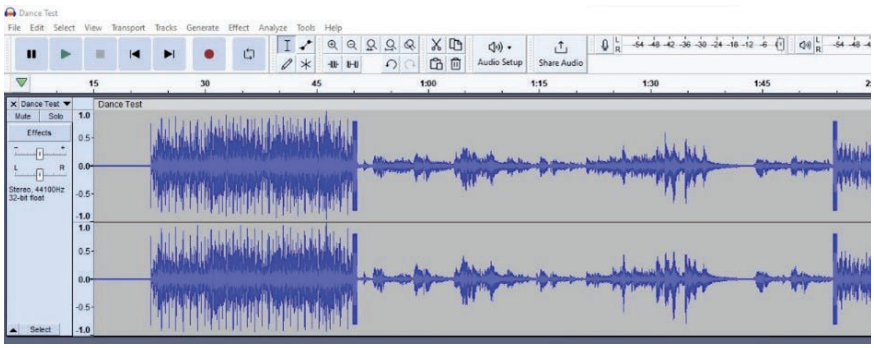
José attempted to hypnotize several of us and was unsuccessful. No arms ever went up. He then claimed success (with the eye-rolling) the month before, but we reminded him that he was *not* able to do that either and offered to send him the video of the entire test as proof. He declined and hung up.

Test 2 – 5/20/23 – Failed Attempt

Donny, forty-six and from Illinois, claimed to be able to "channel vibrations." He said he could use his whole body to not only sense *unheard* music at a distance but also to do an interpretive dance to the music and change the style of dance any time the style of music changed. This one took a while to whittle down to a testable claim—and also to engineer.

The first problem was that none of us could be sure of when his dance style changed. (Personally, I don't know a mambo from a samba.) So, we asked him to *indicate* when a style change happened by raising a hand in the air. He agreed. We had to assemble a recording of seven distinctly different clips of music of different lengths. Each selection had to be between thirty-three and seventy-six seconds long. Still with me?

Donny's task was to indicate (to us) a musical change within two seconds of the actual change—without hearing it. He had to get four of the seven style changes correct to move on to the



One of the applicants claimed he could indicate a musical change within two seconds of the actual change—without hearing it. This waveform shows where CFIIG added a short burst of white noise to the recording—indicated by vertical bars in the recording track—to visually demarcate the selection boundaries on the waveform and show his targets.

money round.

We started the recording, but Donny couldn't hear the music or even know when the music began playing. (We built in some random silence at the beginning.) The seven different-length selections played—everything from James Brown to Mario Lanza—and Donny danced away for over five minutes. We could keep an eye on the musical changes because as the music was playing silently (in the audio editing program Audacity), we could watch the waveform. We added a short burst of white noise to the recording—indicated by vertical bars in the recording track above—to visually demarcate the selection boundaries on the waveform and show us Donny's targets.

Donny began dancing at the wrong spot and made eight guesses as to when the music changed. The first seven were wrong, but he landed the eighth hand-raise right at the end of Willie Nelson's "If You've Got the Money, I've Got the Time." Donny wanted another shot at the prize, but we told him one out of eight was a failure and that he could apply again in a year.

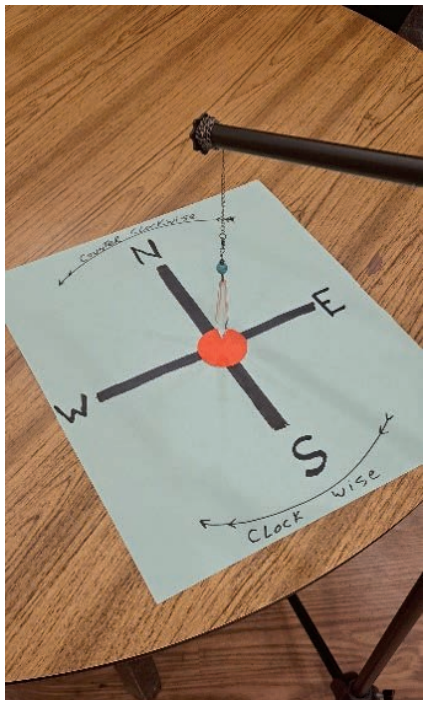
Test 3 – 5/24/23 – Failed Attempt

Renee is a sixty-two-year-old woman from Nevada who went from application to test in just over a month—a rare occurrence. Renee took a bus to Los Angeles to be tested in person. She invented a new language (not a paranormal claim) that, she said, manifests itself through the movement of a pendulum. The pendulum is the conduit to a spiritual realm that she is in communication with. After brief negotiations, what this claim ultimately boiled down to was that Renee said she could get the pendulum to move *without touching it*, using the spirits, presumably.

She arrived at CFI West in the late morning with a binder full of drawings that purported to translate pendulum movements into messages. We had a quick look at the material and told her we'd revisit it if she passed the test. We also let her *hold* the pendulum to demonstrate some of the different movements. In her hand, the pendulum moved in various ways in response to questions she asked of the "spirits."

We told her that there was really no way for us to distinguish between spirits moving the pendulum and subtle movements of her hand—which is why in the actual test we insisted that she *not* touch the pendulum or anything connected to it. We hung the pendulum from a mic stand, and to compensate for any building vibrations or minor air currents causing movement, we laid out a direction chart (see picture) and asked for any of six specific—but randomly chosen—movements. Those movements were—in relation to a dead hang over the center of the chart—north/south, east/west, northwest/southeast, northeast/southwest, counterclockwise, and clockwise. A standard six-sided die roll determined which movement of the pendulum she was to direct—or have the spirits direct.

Renee's task was to make the pendulum move in the die-assigned directions four out of five times. At one point, she asked to rest her hand on the mic stand. We said no; this must be a *touchless* test—which she had agreed to. After three die rolls and no discernable movement, Renee said something about the spirits not cooperating and gave up. She also mentioned that she planned to visit some TV stations while in town and asked if we minded if she told them about being tested at CFI. I told her that would be fine as long as she accurately represented what happened during her test.



One applicant claimed she could get a pendulum to move without touching it, presumably by communicating with spirits.

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One final note: We test these applicants so science can't be accused of dismissing all paranormal claims *a priori*. Not only do we give applicants to our paranormal prize the opportunity to show their talents, but they also have a half-million reasons to turn skeptics into believers. So far, they've failed every time. ■

James Underdown is the founder and chair of the Center for Inquiry Investigations Group, one of the hosts of the *Point of Inquiry* podcast, and the creator and host of *SkeptiLab: The Bunk Stops Here!*

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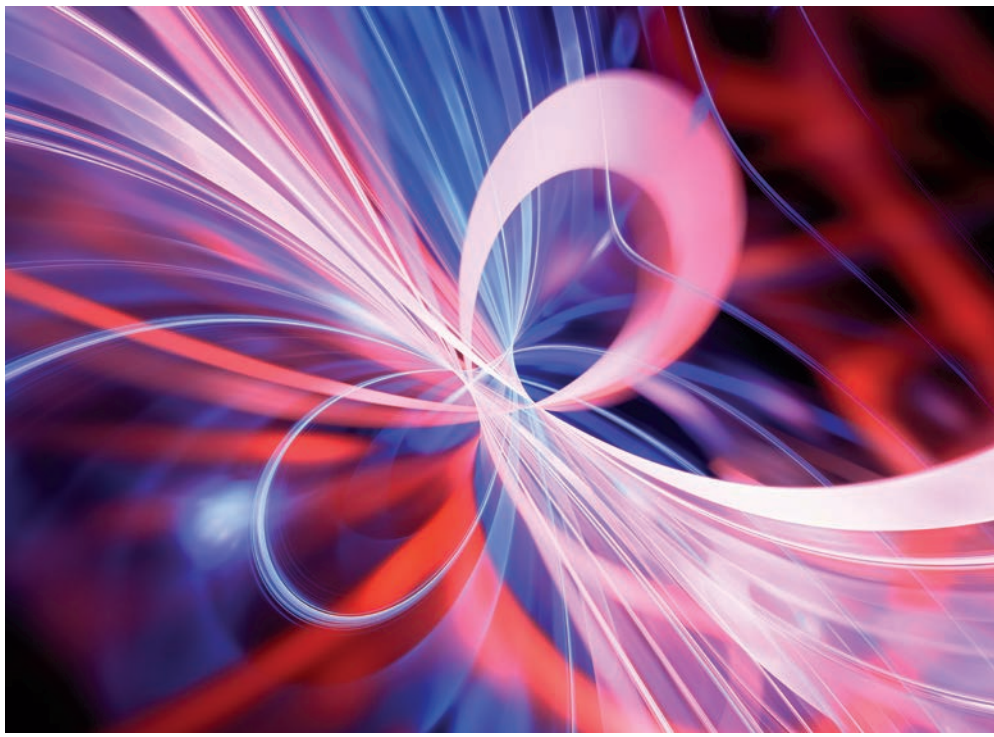
Massimo Pigliucci is the K.D. Irani Professor of Philosophy at the City College of New York. His books include *Nonsense on Stilts: How to Tell Science from Bunk* (Chicago Press) and *Philosophy of Pseudoscience* (coedited with Maarten Boudry, Chicago Press). More by him at https://massimopigliucci.org.

Who's Your Expert?

Should we trust experts? This issue has been very much on the minds of many, in both the general public and the skeptic community, in recent years. The problem of expertise about technical and scientific matters is not new; Plato tackled it in one of his dialogues, the Charmides, in which Socrates takes a comment by one of his interlocutors as a reason to explore the relation between wisdom and medicine. This in turn leads him to ask how "a wise man" might distinguish good from bad medicine, a doctor from a quack. As is often the case, this is not really a dialogue so much as Socrates—who does most of the talking—pursuing a point with the assistance of a willing interlocutor who simply nods along the way:

> SOCRATES: Let us consider the matter in this way. If the wise man or any other man wants to distinguish the true physician from the false, how will he proceed? … He who would inquire into the nature of medicine must test it in health and disease, which are the sphere of medicine, and not in what is extraneous and is not its sphere?
>
> OTHER GUY: True.
>
> SOCRATES: And he who wishes to make a fair test of the physician as a physician will test him in what relates to these?
>
> OTHER GUY: He will.
>
> SOCRATES: He will consider whether what he says is true, and whether what he does is right, in relation to health and disease?
>
> OTHER GUY: He will.
>
> SOCRATES: But can anyone pursue the inquiry into either unless he has a knowledge of medicine?
>
> OTHER GUY: He cannot.
>
> SOCRATES: No one at all, it would seem, except the physician can have this knowledge—and therefore not the wise man. He would have to be a physician as well as a wise man.
>
> OTHER GUY: Very true.



That, in a nutshell, is the problem of expertise. It would seem that the only way to assess whether an expert is in fact an expert is to be an expert oneself. On the positive side, this is what justifies peer review in science: if I wish to write a paper in, say, quantum mechanics or evolutionary theory, I need to submit it to the (usually anonymous) review of several scientists whose specialty is quantum mechanics or evolutionary theory. The idea is not that experts are infallible but rather that they are the best (often the only) people qualified to make a judgment on technical matters.

On the negative side, it would seem that if I think—and I do—that Deepak Chopra talks nonsense when he tells people about quantum mechanical elixirs of youth, I would first have to become an expert in quantum mysticism. But the problem is that quantum mysticism is (I think) quackery, and therefore there is no such thing as "expertise" in quantum mysticism. This despite quantum mechanics being one of the best-established scientific theories of all time (then again, I'm not an expert in quantum mechanics either!). So, again, how is the average intelligent person supposed to distinguish between science and pseudoscience without becoming an expert in both? Moreover, how is it even possible to become an expert in nonsense?

The philosopher Alvin Goldman (2006) has proposed an answer that has the advantage of being rooted in a deep understanding of the problem and yet very much aimed at providing practical suggestions for those of us who happen not to be experts on *everything*.

Goldman proposes a five-point guide to figuring out whether our trust in a prospective expert is well founded or not:

- Examine the arguments presented by the expert and his/her rival(s);
- Look for evidence of agreement by other experts;
- Look for independent evidence that the expert is, indeed, an expert;
- Inquire into what biases the expert may have concerning the question at hand; and
- Examine the track record of the expert.

Every so often, all one needs is the first criterion: we, as nonexperts, are sometimes able to tell whether an alleged expert's arguments hold up to even superficial scrutiny, or we may be able to tell he is a phony even if we are not capable of directly refuting his arguments.

For instance, a politician is—allegedly—an expert in public policy, someone who wishes to convince us that he has a better idea than his opponents about how to run things. We may be able to make inroads in evaluating the reliability of said politician by using Goldman's first criterion. To begin with, most politicians are actually not more knowledgeable about, say, economics than the rest of us. This means that at least some of their arguments can be evaluated directly if one bothers to pay attention and inform oneself a bit. There are also indirect approaches: politicians can sometimes be caught in flagrant contradictions, saying different things to different audiences, so we immediately suspect that there is something fishy going on.

The problem with Goldman's first approach comes when we turn to more esoteric realms, such as debates on evolution or global warming. There, most people really do not have the technical background necessary for a direct evaluation of the arguments, and indirect techniques often fail because a creationist evangelical preacher may well be more rhetorically skilled than an academic professor who rarely leaves the ivory tower.

We move on, then, to Goldman's second criterion: look for evidence of agreement among experts. It works like this: you may be convinced that your car won't start because of a problem with the spark plugs, but if several car mechanics tell you that your spark plugs are fine and instead you need to replace, say, the injection pump, you'd be a fool if you went ahead and bought new spark plugs.

That said, it is unfortunately all too easy to find at least some "experts" who will defend almost any sort of nonsense. The annals of science are littered with (sometimes even prominent) scientists being taken in by one crackpot idea or another. Just think of Newton's fascination with alchemy or Alfred Russel Wallace's (the codiscoverer with Charles Darwin of natural selection) defense of Spiritualism.

Enter Goldman's third criterion: look at any independent evidence that the expert is, in fact, an expert. That immediately rules out most creationists and intelligent design supporters: the overwhelming majority of them do not have degrees in the sciences, and some who do have often received those "degrees" from unaccredited universities. The few with legitimate degrees, such as Michael Behe of Lehigh University or Bill Dembski of the Discovery Institute, have often acquired them in unrelated fields (biochemistry and philosophy, respectively). A PhD in biochemistry does not make someone an expert in evolutionary biology any more than my PhD in evolutionary biology makes me an expert in biochemistry (trust me, I'm not).

Even experts, however, can be biased or simply bought by, say, a pharmaceutical or tobacco company (being bought is another form of bias), which is why Goldman's fourth criterion says that we ought to look for evidence of bias that might affect an expert's opinion. His example is of a famous study published in the *Journal of the American Medical Association*, in which the authors surveyed research on anticancer drugs and kept track of where the funding for the research was coming from. The results, perhaps not surprising to anyone who appreciates human nature, were embarrassing to the medical research community: 38 percent of the studies sponsored by independent organizations (such as the federal government) yielded negative assessments of the efficacy of the tested drugs, while only 5 percent of the studies sponsored by the pharmaceutical industry turned out no effect.

Of course, science is a human activity, and one expects human biases to enter into it. But notice that the JAMA study was done *by scientists*. It is science's capacity for self-evaluation, self-criticism, and self-correction that once again shows us both the power and limits of the scientific enterprise.

Lastly, let's look at the fifth source of evidence available to an educated layperson to figure out how much trust to put in a self-professed expert: the track record. We do this all the time in everyday situations: we keep going to the same mechanics because they have been pretty successful at fixing problems with our car; had they not been, we would have looked for another mechanic. Of course, like every tool described so far, this one needs to be used with caution. A common misuse is related to what we might term the *celebrity effect*, a tendency of some successful people to opine on anything and everything, making pronouncements that many will take at face value even if such pronouncements concern fields that are entirely disconnected from the one in which the person in question has been successful.

Goldman is well aware that his five recommendations do not provide us with an airtight method to tell expertise from flimflammery. Indeed, a large part of my point is that there is no such foolproof method. But Goldman invites us to rely on the general approach known as inference to the best explanation, which seeks to weigh all the available evidence and then make an educated guess about where the truth may lie. More often than not, educated guesses are all we have. In that case, the more educated, the better. ■

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[BEHAVIOR & BELIEF

STUART VYSE

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Nature Falls for Autism Pseudoscience

On May 10, 2023, the journal *Nature* stooped to a new low when it credulously highlighted one of the most rampant forms of pseudoscience in the world of autism. Facilitated communication, a method thoroughly debunked in the 1990s, has come back, repackaged variously as rapid prompting method (RPM), spelling to communicate (S2C), or simply "using a letter board." These variants are quickly spreading throughout the autism world. Apparently, we can count the editors of *Nature* among those who have been fooled.

All these methods involve nonspeaking individuals typing on a keyboard or pointing to letters on a letter board to spell out messages; taken at face value, the results are truly miraculous. People who have never spoken a full sentence in their lives—much less learned to read—are suddenly capable of writing essays, poems, and novels. They seem to have a hidden intelligence that no one ever imagined they possessed. The only catch is that these techniques all have something else in common: the involvement of another person. In the case of facilitated communication, a "facilitator" holds the hand, wrist, or elbow of the nonspeaking person as they type. Double-blind tests published in the 1990s showed that—in every case—it was the fluent facilitator who was typing out the messages, not the nonspeaking person. When asked questions that the facilitator could not answer, the messages typed out were wrong. Every time. In a Ouija board–like process, the facilitators were unconsciously controlling the communication.

The new variants of facilitated communication involve the nonspeaking person pointing at a letter board with a finger or pencil; however, rather than simply placing the letter board on a table, a "communication partner" holds the letter board in the air. It is not clear why this is necessary, but it is clear that the involvement of another person muddies the question of who is authoring the communication. Does the finger touch the letter board, or does the letter board touch the finger? Publicly available videos often show the letter boards bobbing around in the air while the nonspeaking person looks somewhere else (e.g., FCisNotScience 2023). Furthermore, perhaps having learned a lesson from the 1990s, the purveyors of these letter board techniques have assiduously avoided participating in research that would definitively show who's authoring the messages.

Given the total lack of data in support of these methods, many professional organizations have issued position statements opposing the use of facilitated communication (see the complete list at https://www.facilitatedcommunication.org/), and the American Speech-Language-Hearing Association has also issued a policy against the use of RPM, stating that "information obtained through the use of RPM should not be assumed to be the communication of the person with a disability" (American Speech-Language-Hearing Association 2018).

All this background is public knowledge, easily obtained by *Nature*, but they seem to have missed it or chosen to ignore it. Their May 10 feature story was titled "'The Best Way to Get It Right Is to Listen to Us'—Autistic People Argue for a Stronger Voice in Research," and the quotation in the title is purported to have come from a nonspeaking autism advocate who is shown in an accompanying photo pointing at a letter board held in the air by someone outside the frame of the picture (Mega 2023). Be-

A boy using a pencil to point to a letter board held in the air by an adult.

cause the quote was not derived from an evidence-based communication method, we have no way of judging whether these were the nonspeaking person's words or not. And, until the proponents of these methods agree to testing, we will never know.

This is not the first time a prestigious science journal has been taken in by these dubious autism communication methods. In 2020, *Nature*'s open access spinoff journal *Scientific Reports* published an elaborate eye-tracking study of letter board users that purported to show that nonspeaking individuals were the authors of their communications (Jaswal et al. 2020), but that study did not attempt the far simpler tests—like those used in the 1990s with facilitated communication—that would have clearly settled the question. The eye-tracking study has subsequently spurred several critiques (Beals 2020), including one by me (Vyse 2020). In 2018, the journal *Behavior and Brain Sciences* published an article that drew evidence in support of its arguments from quotes from people with autism. Although it was never acknowledged by the authors, a substantial proportion of these testimonials were obtained through facilitated communication and were simply accepted as genuine reports from people with autism. As I explained in my previous article "An Adventure in Peer Review," I remain bewildered that the article was published with those quotes included (Vyse 2019).

What's at Stake?

This renewed controversy over communication methods has emerged in the context of a larger political fight within the autism community. The *Nature* story was about efforts on the part of some autism advocates to have people with autism more involved in the planning and execution of autism research. In theory, this sounds like a good idea, but this effort has been largely dominated by verbal advocates on the higher functioning end of the autism spectrum. As it is now defined, autism spectrum disorder (ASD) has a remarkably wide range that can include both highly verbal Harvard graduates and nonspeaking people who engage in repetitive and self-injurious behaviors. It includes both people who will be fine and may even thrive living independently and people who will never be able to live independently without substantial support.

Parents of children on the severe end of the spectrum argue that the needs of their children are substantially different than those of the verbal self-advocates on the other end of the spectrum. Furthermore, if the research agenda is driven by people on the less severe end of the spectrum, the approximately 30 percent of children with autism who will never develop speech will be left behind (Tager-Flusberg and Kasari 2013).

Recruiting the Letter Board Users

Finally, in an odd alliance, some parents of nonspeaking individuals who believe in facilitated communication or one of its variants have been recruited to this fight by the advocates on the higher functioning end of the spectrum. Thus, you have the peculiar situation of an article in the scientific journal *Nature*, whose title is drawn from a quote the American Speech-Language-Hearing Association says, "should not be assumed to be the communication of the person with a disability." We have no evidence that the person being quoted said those words, and yet she is being put forth as the poster child for a highly politicized movement. In my view, this is the real travesty. This person has achieved remarkable visibility, including quotes and a photograph in a widely read science journal, yet the available scientific evidence suggests that rather than speaking out for herself, she has been silenced and someone else has substituted their voice for hers. All this may have happened with the best of intentions, but if I am right, it is a substantial injustice nonetheless. And the journal *Nature*, which ought to know better, is complicit in making it happen.

This is not the first time a prestigious science journal has been taken in by these dubious autism communication methods.

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To learn more about the perils of facilitated communication, visit facilitated-communication.org. ■

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[THE PRACTICAL SKEPTIC MICK WEST

Mick West is a writer, investigator, and debunker who enjoys looking into the evidence behind conspiracy theories and strange phenomena and then explaining what is actually going on. He runs the Metabunk forum, tweets @mickwest, and is the author of the book *Escaping the Rabbit Hole*.

NASA Studies UFOs?

The National Aeronautics and Space Administration (NASA) is studying UFOs—and the first question any good skeptic will ask is "Why?" UFOs have long been relegated to the same category as crop circles and Bigfoot: a decades-long litany of pseudoscientific claims and ambiguous evidence. There are constant intimations that the phenomenon is about to be solved or something significant revealed, but nothing ever happens. The UFO culture is marked by fervent belief, genuine curiosity, and a huge diversity of opinions. The UFO ecosystem is centered on entertainment that, out of necessity, feeds the belief with dramatic, entertaining misrepresentations and outright fabulations.

NASA is the U.S. government agency responsible for the nation's civilian space program and for aeronautics and aerospace research. Established in 1958, NASA conducts space missions to explore our own planet, the solar system, and the universe beyond. It deploys satellites to observe Earth's weather and climate, operates rovers to study Mars, and sends probes deep into space. NASA's Hubble Space Telescope and the James Webb Space Telescope have transformed our understanding of the cosmos. It's a serious organization, so why is NASA getting involved in a topic that many feel is pseudoscientific nonsense?

The answer is twofold. First, it's because Bill Nelson said so. Nelson is the head of NASA, and the study was basically his idea. It has its roots, of course, in the vast amount of public interest that was generated starting in 2017 with the publication of *The New York Times* story revealing the existence of a Pentagon program that studied UFOs and an associated release of U.S. Navy UFO videos. Nelson watched those videos, talked to the pilots, and seemed convinced that there was something to it. He personally commissioned an initial inquiry in June 2022 (Knapton 2022).

The second reason—and why he was not simply laughed at for suggesting a silly hunt for aliens—is that UFOs are real. Not real in the sense that there are actual flying saucers but real in that sometimes there are things in the sky that cannot be initially identified. Those things might be foreign drones, misidentified birds, faulty radar, observer error, balloons, or something else. But regardless of what any individual UFO actually is, if a pilot (especially a military one) sees something they cannot identify, then that presents a potential problem that needs to be addressed.

The public interest in UFOs as alien craft, as well as a similar interest by some in the military, has resulted in an unfortunate hybrid of genuine justified research into what's causing these objects to be unidentified, mixed with an unfounded hunt for a "nonhuman intelligence" that some suspect to be behind a few cases.

This intense public interest has also led to an evolution of acronyms. First, *UFO* was renamed *UAP*, or unidentified aerial phenomena. The Pentagon started a UAP task force, which was straightforwardly called the UAP Task Force (UAPTF). The UAPTF was briefly succeeded in November 2021 by the Airborne Object Identification and Management Synchronization Group (AOIMSG, not straightforwardly pronounced "aim-sog"). This, in turn, was succeeded in July 2022 by the All-Domain Anomaly Resolution Office (AARO, pronounced "arrow").

As part of the branding of AARO, UAP was redefined as "Unidentified Anomalous Phenomena." No longer

NASA's UFO/UAP panel with Sean Kirkpatrick of AARO presenting a new video of three UAP that were determined to be distant planes.

confined to aerial phenomena, UAP now included odd things underwater, on or under the ground, in the air, and in space.

NASA'S UFO Hearing

The NASA inquiry and the work of AARO were discussed at an unprecedented public meeting held on May 31, 2023 (NASA 2023). A sixteen-member NASA independent study group discussed the work they had done so far and their plans for the future, and the director of AARO, Sean Kirkpatrick, gave a presentation on their findings so far and their plans for the future. It was essentially the government and the military telling us everything they could make public about the topic of UFOs.

Kirkpatrick's talk followed the pattern of similar government presentations on UFOs. Nothing very interesting was revealed that would please the "UFOs are aliens" contingent of UFOlogy. Indeed, Kirkpatrick has made crystal clear the lack of extraterrestrial involvement, saying earlier that month, "For the record, in our research, AARO has found no credible evidence thus far of extraterrestrial activity, off-world technology, or objects that defy the known laws of physics."

At the NASA hearing, he presented two videos: one that had never been seen before—always an exciting moment for UFOlogy and for me personally, as my primary UFO interest is in analyzing videos. The older video was the "Middle East Sphere," which showed something that looked rather like a mylar balloon moving very fast. Kirkpatrick explained AARO lacked data on this object. However, they also said it "demonstrated no enigmatic technical capabilities and was no threat to airborne safety."

This qualification seemed to be overlooked by the UFO community, who had adopted this sphere as a possible alien drone or anti-gravity craft. But the only explanation that fits "no enigmatic technical capabilities" is that it was simply a balloon. Balloons, AARO has found, are what nearly half of all pilot-reported UFOs resemble (AARO calls them "balloon-like entities," or "balloons" for short).

The new video showed what looked like a sky full of stars. Three dots are observed to move around together. Kirkpatrick explained that the three dots were distant oncoming planes (a frequent source of UFO reports) and that the apparent movement was caused by the camera moving (another very common UFO generator).

He was then asked what the dots in the background, which were not moving, were. He said they were stars. I immediately recognized this as incorrect, because if a camera movement caused the apparent motion of distant planes, it would also make the stars move. The dots must just be some camera artifact, like stuck pixels.

I immediately posted this on Twitter and tagged @DoD_AARO. I don't know if Kirkpatrick read it, but after the break, he came back for an unscheduled update and explained he was no longer sure they were stars. I found this all rather surprising, as it's such a basic camera effect that the head of AARO really should be familiar with.

Calibration

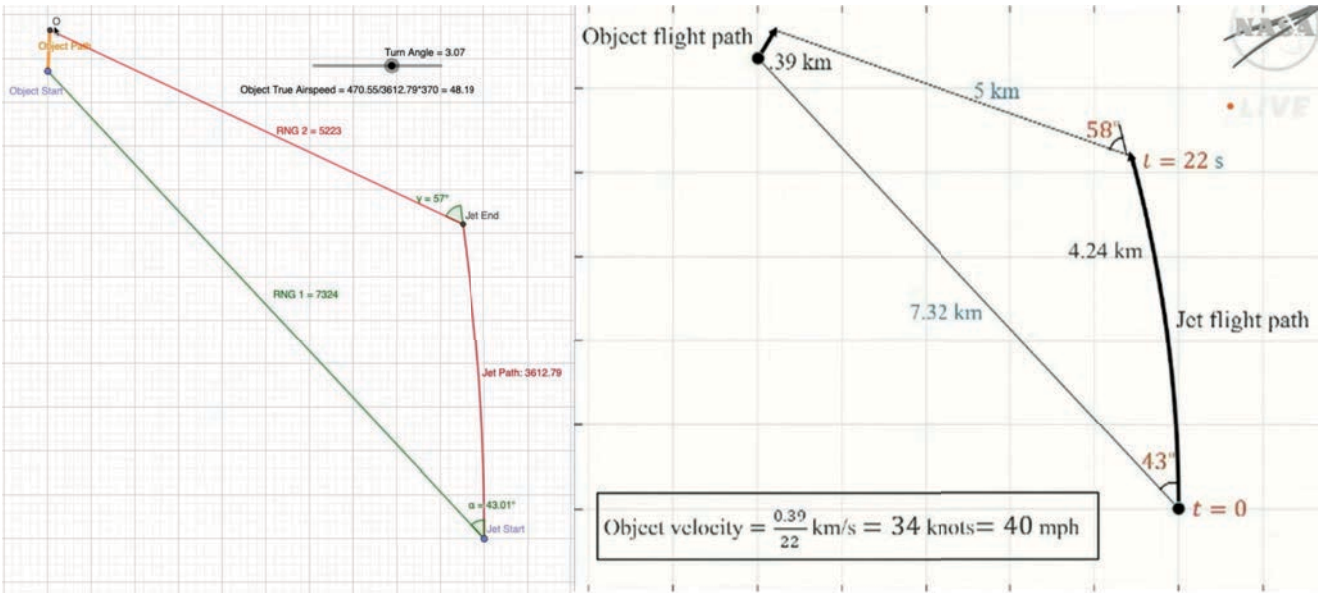
The word of the day at the hearing was *calibration.* The issue, discussed interminably, was that the existing data on UFOs came from uncalibrated instruments. Specific mention was made of systems such as the ATFLIR tracking pod. The ATFLIR is designed to track targets, so all the design decisions and tweaking are geared toward the camera being able to keep a lock on a target.

This relates to the Navy's "Gimbal" video, which shows what looks like the glare from a very hot object. However, without the calibration details of the sensor, as well as the operator settings in use (such as gain), it's impossible to correlate this with possible objects, such as a F/A-18 engine, so it's difficult to rule things in or out. So *calibration* ruled the day. Calibrated instruments were needed for NASA to do real science. Existing systems were inadequate.

I feel this is only partly true. The anomalous nature of UAP is often both their visual appearance and their physical motion (hyper-rapid acceleration or unnatural hovering). There is nothing to stop you from accurately recording those things with a modern mobile phone (or preferably two.) No calibration is required to measure the angular distance traveled with enough accuracy to determine anomalies.

The Skeptical Astronaut

The most famous member of the NASA panel is Scott Kelly, a former Navy captain, fighter pilot, and test pilot with 18,000 flight hours, who is also a former NASA astronaut who spent a year in space. Kelly provided a healthy grounding for the panel. We've



The author's 2019 analysis of "Go Fast" (left) and NASA's 2023 analysis (right). They differ slightly but both conclude that the UFO/UAP was moving slowly.

heard from some Navy pilots that they saw UFOs every day, yet Kelly stated that he had never seen one and never really heard people talk about seeing them.

Kelly did relate two "UFO" stories (2:52:05). In one story, he and his co-pilot saw something strange whizz past the cockpit. They circled back around and determined it was a Bart Simpson party balloon. In the second story, he described seeing a weird foreign object floating in space blocking the Space Shuttle cargo bay doors. This was observed by other astronauts and was a cause for some concern until suddenly the perspective clicked, and Kelly realized he was looking at the International Space Station, miles away but appearing close due to the stark clarity of the vacuum of space. The very best experts can be fooled by optical illusions. If they don't figure them out, then optical illusions can become UFOs.

'Go Fast' Redux

Joshua Semeter, the director of the Center for Space Physics at Boston University, gave a presentation on how science can be applied to analyze a UFO video (2:45:00). The video he chose was "Go Fast," and to my great amusement, the analysis he presented was almost identical to the analysis I'd done (with help from others at Metabunk) and posted on YouTube four years ago (West 2019). Even the diagrams he used were practically the same. While the analysis was a bit out-of-date, it was still gratifying to have some validation from such an august panel, even if they did not credit me.

NASA's Plans for UFOs

NASA seems to be trying to make the best of what was initially an unwelcome assignment from their boss. UFOs seem like a silly subject, but if we keep the search for E.T. in its appropriate place—as a very unlikely outlier hypothesis—then good science can be done.

Dan Evans, an administrator at NASA who led the discussion, summed up their goals:

> [Studying UAP] provides an opportunity for us to expand our understanding of the world around us. It's an organization dedicated to exploring the unknown; this work is in our DNA. Secondly, this study aims to enhance situational awareness. The presence of UAPs raises concerns about the safety of our skies. And it's this nation's obligation to determine whether these phenomena pose any potential risks to airspace safety. By understanding the nature of UAPs, we can ensure that our skies remain a safe space for all. In order to achieve these goals, it is crucial that we employ a scientific lens for our UAP work.

I see no reason this study, even with its uncomfortable roots in alien hunting and even the supernatural, should not produce good science. We will learn about the limits and failings of our sensing instruments. We may learn about illusions that pilots are prone to. We might discover new atmospheric phenomena. There's even a very slight—vanishingly small but not invisible—chance that we will discover a new form of life.

I don't think we will, but science demands an open mind. I just hope that extraterrestrial believers also keep an open mind and will accept the likely results of the NASA study as yet another clue that we are indeed alone on this planet and that the best chance of us finding life is not in blurry videos but in NASA's great success: the James Webb Space Telescope and its study of the atmospheres of distant planets. ■

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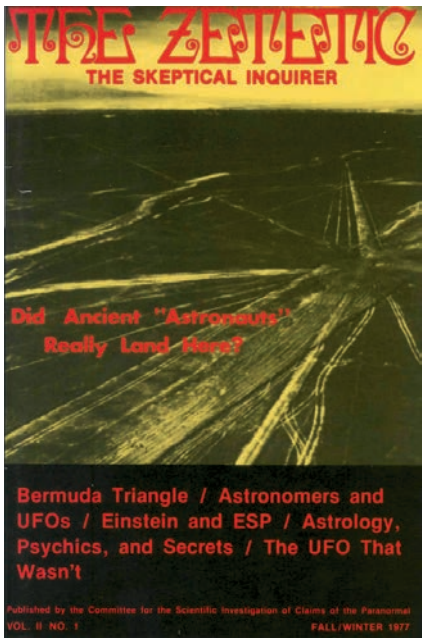
The Bermuda Triangle: Proof of Obtuse Thinking


THE ZETETIC
THE SKEPTICAL INQUIRER
Did Ancient "Astronauts" Really Land Here?
Bermuda Triangle / Astronomers and UFOs / Einstein and ESP / Astrology, Psychics, and Secrets / The UFO That Wasn't
Published by the Committee for the Scientific Investigation of Claims of the Paranormal
VOL. II NO. 1
FALL/WINTER 1977

Welcome aboard, friends! In "The Time Warp," we aren't limited to present-day examination. We use Skeptical Inquirer's rich history to examine skepticism—from the future. On this voyage, we travel to Fall/Winter 1977 (Vol. 2, no. 1) and the third issue of Skeptical Inquirer.

Some pop-culture bytes to get you into late 1977: NASA launched space probe *Voyager 1* (September 5). Atari released the 2600 (September 11). A blindfolded psychic named Romark drove a car into a parked police van (October 12), and *Close Encounters of the Third Kind* had its first theatrical release (November 16).

The Fall/Winter 1977 issue marked the beginning of Kendrick Frazier's amazing forty-five-year run as editor. We miss you, Ken! It also brought other important changes. *The Skeptical Inquirer* was added as the byline underneath *The Zetetic*. The developing title was reportedly a jab at *The National Enquirer*. Fall/Winter 1977 had the first topical cover—specifically a photo of the Nazca lines relevant to the ancient aliens investigation. It also introduced the "Psychic Vibrations" column, which offered a spicy charcuterie of skepticism-based treats.

Some Skeptical Thoughts from the Time

Ronald D. Story skewered Von Däniken's evidence that extraterrestrials spurred the development of ancient human civilizations.

James E. Oberg and Robert Sheaffer criticized *Science Digest* for promoting pseudoscientific claims and space hoaxes.

Robert Sheaffer described the similarities between evidence for fairies and evidence for non-fairy cryptids and UFOs. Hello! The foremost fairy fan was none other than Sir Arthur Conan Doyle. Pray continue, Mr. Sheaffer.

Martin Gardner uncovered the skepticism of Albert Einstein. In a personal letter obtained by Gardner, Einstein explained that he was skeptical of psychic phenomena and that he wrote a preface for Upton Sinclair's *Mental Radio* because of his personal connection to the author.

Philip J. Klass compared the claim that UFOs were beyond traditional scientific inquiry to Blondlot's claim that N-rays were beyond traditional scientific inquiry.

Dennis Rawlins derided astrologers, psychics, and their believers. "The reason astrologers and parapsychologists continue to get away with passing themselves off as experts is as simple as it is deplorable: much of the public is just one iota more incompetent than they" (78).

Cutting Corners: Kusche, Curiosity, and Critical Thinking

On this voyage, we dive deep into the Bermuda Triangle, the legendary area defined by Miami, San Juan, and Bermuda. By this time in 1977, the paranormal view of the Bermuda Triangle and a traditionally skeptical rejoinder had already been established. Charles Berlitz exemplified the paranormal view. In his hit 1974 book *The Bermuda Triangle*, Berlitz reviewed the triangle's association with strange events and with watercraft and aircraft that disappeared altogether. Berlitz suggested that paranormal explanations such as time-space warps, extraterrestrial activity, or technological interference caused by a lost underwater civilization could be at the center of the affair.

In response, Larry Kusche suggested that the Bermuda Triangle wasn't so peculiar. In his 1975 book *The Bermuda Triangle Mystery—Solved*, Kusche demonstrated that the dramatic tales tied to the Triangle were frequently embellished. A more accurate view of these stories shows the rate of mishaps in the region parallels similarly traveled areas.

Having addressed the Bermuda Triangle broadly, Kusche's 1977 article revisits the topic tangentially. Kusche was primarily concerned about high school students being assigned "high interest reading" that might not pique their critical thinking (36). To illustrate, Kusche shared a story about the *Sandra*, a tramp steamer that unfathomably disappeared in the Bermuda Triangle despite calm conditions. Kusche wondered how many students have the curiosity quotient to travel beneath the story's perplexing surface.

Kusche proceeded to fillet this small blowfish. Kusche asked, how would the author know the sea was calm when everybody on board disappeared shortly thereafter? Kusche explained how a frivolous story detail can convey a false familiarity with the original event. Additional inquiry revealed that the ship's length and date of departure were both wrong. A much smaller ship sailed in April—not June as reported—and the weather corresponding with the true departure date was not calm but nearly as gusty as a hurricane.

Kusche's analysis gained in depth what it lacked in breadth. Kusche demonstrated how anecdotes pointing toward a Bermuda Triangle mystery can be undone by simply having the curiosity to ask probing questions and conduct some follow-up.

Despite Kusche's acute analysis, the Bermuda Triangle's paranormal siren song remains adjacent to public consciousness. Shortly after 1977, Berlitz tripled down on the book *The Bermuda Triangle* by cowriting a cringey movie titled *The Bermuda Triangle* (1978) and a "documentary" titled *The Bermuda Triangle* (1979). Berlitz promoted his view of the triangle further in the book *Without a Trace* (1977; reviewed in the Fall/Winter 1977 SI by Kusche and Klass). Of course, Berlitz's work is just a small part of the cornucopia of articles, books, and additional forms of media reminding people that something strange could be afoot in the Bermuda Triangle. Television shows examine the Triangle "mystery" directly (e.g., *Curse of the Bermuda Triangle*, 2020). Movies occasionally siphon the pseudomystery as part of broader horror and science fiction narratives (e.g., the aforementioned *Close Encounters of the Third Kind*). Barry Manilow and Fleetwood Mac both performed songs titled "Bermuda Triangle." Board, console, and arcade gamers can all play versions of *Bermuda Triangle*. Atari developed a Bermuda Triangle console game for the 2600. Bermuda Triangle folklore even seeped into American football; an early 1980s Buffalo Bills defensive trio was known as the Bermuda Triangle because runners who entered their territory never made it out.

Post-Warp Summary

Surely many of the people who promote the Bermuda Triangle don't take the paranormal portion seriously. In addition to Kusche's article, the third issue of Skeptical Inquirer included a comic about a "media triangle, where objectivity mysteriously vanishes" (7). I don't believe the Triangle is paranormal, but I still streamed the movie *Bermuda Tentacles*. I'm hoping some executive will sign or cosign the deal for *Bermuda Tentacles II: Atlantic Bugaloo*. However, many people sincerely believe the Bermuda Triangle is otherworldly. They maintain this belief despite Kusche's discrediting, the decades-long failure to find solid evidence for foggy paranormal claims, and the unremarkable travel that occurs through the region daily.

Sincere belief in the Triangle's paranormal powers continues because the public lacks the curiosity quotient to investigate this anthropogenic mystery in the manner Kusche described. The main difference is that the public chooses the high-interest material, whereas 1977 high school students had it chosen for them.

Personally, I would love to see elevated curiosity quotient reduce the Bermuda Triangle's paranormal-promoting angle. A more informed perspective could allow us to enjoy the Bermuda Triangle's entertaining qualities without jettisoning critical thinking. On that, I hope to be proven right someday.

Skepticism, ahoy! ■

[SKEPTICAL INQUIREE BENJAMIN RADFORD

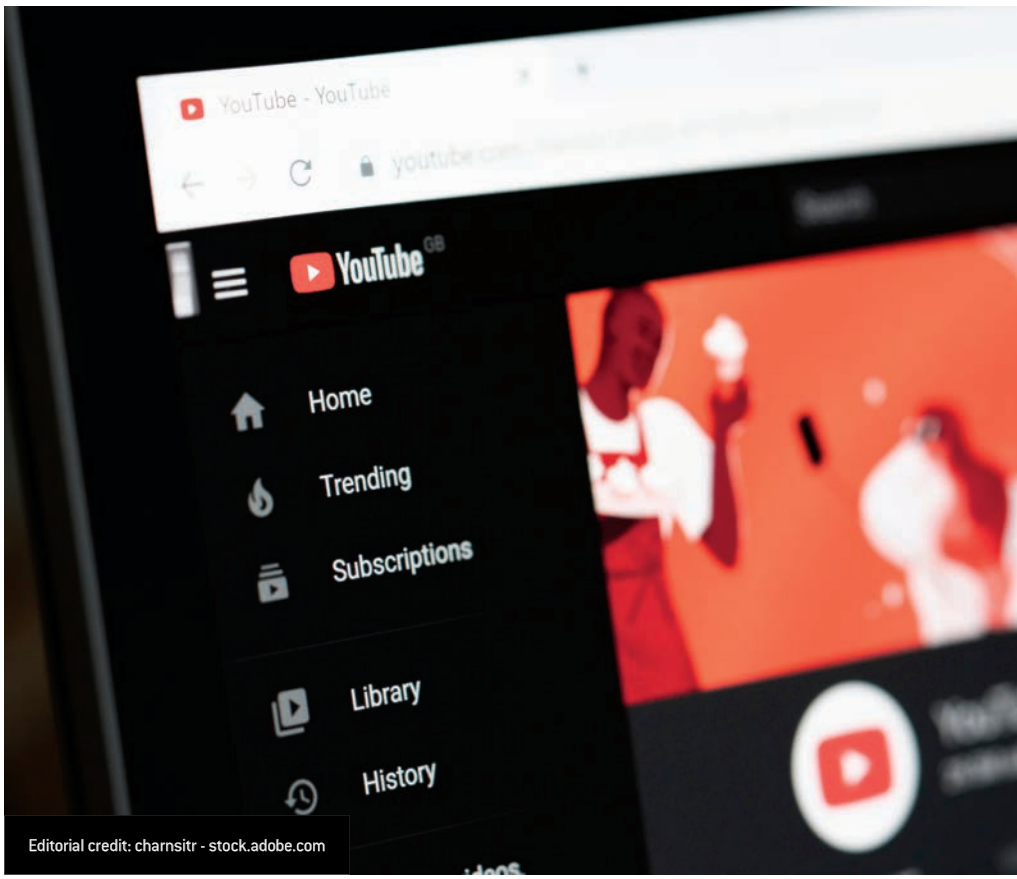
Benjamin Radford is a research fellow at the Committee for Skeptical Inquiry and author or coauthor of fourteen books, including *America the Fearful: Media and the Marketing of National Panics*.

Information Wars: Videos vs. Books

Q: **I saw you post on social media criticizing YouTube as a source of information. Why? Books are fine, but I'm researching a topic using YouTube and finding it's faster and helpful in finding relevant information.**

—Ryan M.

A: At first glance, this question came off as vaguely trolling; it seemed self-evident to me why a book would be, on the whole, a much better research resource than a YouTube video. It also hinted that I was being snobbish; I acknowledged—before Ryan had the chance to point it out—that as a published author (via book, magazine, journal, and newspaper), I was likely biased toward print. There may also be a generational bias; though I routinely use the internet to research, I'm old school and have hundreds of physical books (and yes, I still subscribe to printed magazines and newspapers). It's a personal preference; my concern is with the quality of information regardless of how it's delivered.



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The question raises legitimate media literacy issues about where people get their information. It's not just Ryan; according to a 2020 Pew Research poll, one quarter of all U.S. adults say they get news and information on YouTube. And it's not just YouTube; many people get their news not directly from journalists but instead filtered through late night talk show hosts, including Jimmy Kimmel, Jon Stewart, Stephen Colbert, and cast members of *Saturday Night Live*. From a literacy perspective, this poses several problems, including that the content is delivered within the context of a joke. Satirical humor often uses exaggeration, which is one reason countless political and social commentary memes are factually wrong despite containing a kernel of truth. As a result, comedians routinely create straw man logical fallacies to deliver a solid punchline—and audiences may not know the extent of the exaggeration unless they are also consuming quality reporting to (implicitly or explicitly) compare it to.

As National Public Radio's show *Fresh Air* noted:

> Even though *The Daily Show* often comes up with facts and stories missed by other news sources … it would be wrong to describe what [Jon Stewart] does as "journalism." "We don't do anything but make the connections," he says. "We're just going off our own instinct of, 'What are the connections to this that make sense?' And this really is true: We

> don't fact-check [and] look at context because of any *journalistic* criteria that has to be met; we do that because jokes don't work when they're lies. We fact-check so when we tell a joke, it hits you at sort of a gut level—not because we have a journalistic integrity, [but because] hopefully we have a comedic integrity that we don't want to violate." (Stewart 2010)

This primacy of entertainment over information is also inherent on platforms such as YouTube, TikTok, and Instagram. While there is some purely journalistic and informational content on YouTube (typically tutorials and branded videos from established, credible news and educational organizations), much of it is aimed at clickbait entertainment. What counts is not accurate, carefully fact-checked original investigative journalism but instead how funny, cute, or outrageous the video is. Fringe and extremist views are amplified; that's one reason conspiracy videos are particularly insidious.

Books tend to be much better sources of information than videos for several reasons, including the ability to cite references and provide an index, cross-references, and so on. Ryan replied noting that YouTube is superior because "a book is just one book" while YouTube offers easy access to millions of sources in one place that can be consumed on the comfort of a sofa. It is certainly true that YouTube videos can offer links to other sources (typically videos). YouTube, unlike books, has algorithms that recommend other related content, often creating a rabbit hole effect. Because repetition breeds familiarity, which in turn gives the impression of truth, a person can watch a half-dozen YouTube videos back-to-back that seem to reinforce each other's validity. After a person has watched many videos from different sources (of wildly varying—sometimes nonexistent—credentials and credibility), it's easy to come away thinking there must be some truth to even patently false claims.

I noted that a book is just one book in the same way that a video is just one video. But a good nonfiction book is actually many (often dozens or even hundreds) of other books, available in the references, citations, and bibliography. There's also much more content in a given book, and that information is far more accessible than in a video. YouTube is a video platform and thus the people featured are often reading from scripts—or, far worse, talking off the cuff.

The average YouTube video, according to Statista, is just under twelve minutes long—and that skews high because of gaming and film/animation videos. For videos about people, blogs, and educational content, the average length is just over eight minutes (including introductions, banter/filler, and obligatory pleas to "Like and subscribe!"). Just in terms of education and efficiency, it's very difficult to convey any depth of knowledge in such a short time. The average person reads between 200 and 300 printed words per minute and could have read between 1,600 to 2,400 words during those eight minutes (and of course visually skipped ahead to important and relevant sections via keywords and headings). Brevity sacrifices information, so if a presenter on a YouTube video says something you want to find out more about (or fact-check), it's hard to do so. If an author writes something you want to find out more about, look at the references.

There's another inherent limitation to any video format; to use YouTube information in written form, it needs to be transcribed, either laboriously by hand or automatically, which often introduces errors (homophones are especially problematic). For example, in a video the narrator may have said that some event happened in 2020 but the transcription instead reads 2022, and no one catches it.

There's also the issue of source credibility; a published book—especially one from a known, reputable publisher such as Random House or Oxford University Press—implies some degree of credibility. An editor and publisher have examined the book, found it worthy of publishing, edited, and (in some cases) fact-checked it. This isn't to say, of course, that YouTube videos and self-published books are inherently untrustworthy or that published books are inherently accurate or error-free. But overall, they are far more credible.

The promise and appeal of YouTube—as with blogging and the internet generally—is democratization of publication. Anyone can post pretty much anything on YouTube. YouTube is content agnostic; the platform doesn't know, and doesn't care, whether the content creators have done any research, have any education, or have any knowledge of their subject. As long as it conforms to their terms of service, anything goes. You want to post an authoritative video explaining in detail why Finland doesn't exist or how the Statue of Liberty was built by gerbils in 1992? Go right ahead.

Just as Wikipedia, like a library, is not a source of information, neither is YouTube. These are instead platforms and venues for other sources and references. While Wikipedia, in its infancy, was criticized for misinformation, its quality has improved significantly in recent years due to stricter requirements for sourcing and references (with a nod to Susan Gerbic's ongoing Guerrilla Skeptics on Wikipedia project). YouTube has no such quality control and, for example, "is not a reliable source of medical and health-related information. YouTube's popularity-driven metrics such as the number of views and likes should not be considered quality indicators" (Osman et al. 2022).

To be clear: I have no issue with YouTube; it can be valuable and informative. There are indeed many well-researched videos that inform, educate, and entertain along the way. The medium is also excellent for topics that require visual explanations or include original photographs, film, or other visual material and can also be a boon to people with learning or reading disabilities. But, yes, a given book is indeed a more useful research resource than a given YouTube video. ■

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Persuasive Bullshitters and the Insidious Bullshit Hypothesis

Short of lying, bullshitting involves communicating something with little to no regard for the truth, established knowledge, or genuine evidence. Although most people believe bullshit is relatively harmless, part of what makes bullshit compelling and appealing is that it often sounds beneficial, confirming, and credible. Four experiments in persuasion suggest that bullshit can have more influence than both lies and, in some cases, evidence-based frames of the very same information.

JOHN V. PETROCELLI

Claptrap, baloney, buffoonery, codswallop, empty-talk, garbage, hogwash, nonsense, poppycock, flapdoodle, flim-flam, flummery—and often better referenced as bullshit—our world appears to be full of it. Yet what exactly is bullshit? Bullshit is what emerges when people communicate with little to no regard for the truth, established knowledge, or genuine evidence (Frankfurt 1986; Petrocelli 2018; Petrocelli 2021a). Bullshitting behavior involves a broad array of rhetorical strategies that help us sound like we know what we're talking about to impress others, persuade others, influence others, or explain things in an area in which our obligations to provide our opinions exceed our knowledge in that area (Cheyne and Pennycook 2016; Littrell et al. 2020; Petrocelli 2018; Petrocelli 2021a). Bullshit is often abstract, lacking in sources and logic, or riddled with acronyms and business-speak jargon. Part of what makes bullshit compelling and appealing is that it often sounds beneficial, confirming, and credible—and thereby may be persuasive.

Much of the empirical research on bullshitting has dealt with the *when question*—that is, understanding *when* people are likely to bullshit us. Here, I offer a closer focus on the evidence that addresses part of the *why question*, that is, understanding the potential functions of bullshit. If bullshit is an undesirable communicative substance, *why* do people engage in the behavior so very often? Better understandings of when and why people bullshit us should place us in a much better position to detect and dispose of this unwanted social substance.

Bullshitting Isn't Lying

Bullshit is not the same as lying (Frankfurt 1986). Although the liar and bullshitter are both deceptive in that they both *appear* concerned with the truth, only

the liar is actually concerned with truth; the bullshitter is not. When someone lies to us, their objective is to get us to believe something they don't believe is true. If your colleague were to say something and knows perfectly well it just isn't so, then he is lying. Whereas the liar doesn't believe what she says is true, the bullshitter has no idea whether or not it's true and, frankly, doesn't care. In fact, sometimes—just by chance or accident—the bullshitter says something that is true but even she wouldn't know it because she's not concerned about the truth, established knowledge, or evidence that may otherwise support her claims.

An important difference between lying and bullshitting involves the social reactions to these two forms of communication. When people lie to us, we're very unhappy with them, and they often pay great consequences for their lies. People tend to react to the lies with strong disdain and contempt, and there may be severe consequences for being caught in a lie (e.g., "She's a damn liar. That woman should be fired!"). In the case of bullshitting, the social consequences are much less severe (Petrocelli, Silverman, et al. 2023). The bullshitter may communicate the very same message as the liar, yet because she doesn't really know what she's talking about—and neither does she really care what the evidence suggests—we typically pass off her bullshit as a mild social offense (e.g., "Oh, she's *just* bullshitting again."). We assume the bullshit is harmless—but this is where we couldn't be more wrong.

Insidious Bullshit Hypothesis

Although bullshitting is often evaluated less negatively than lying (Petrocelli, Silverman et al. 2023), Harry Frankfurt (1986) proposed that bullshit is more damaging to society than lies. Not only by definition is there likely to be more bullshit than lies in the world, Frankfurt believed that pursuit of truth is of paramount importance—and although the liar's concern for truth is a corrupt one, it is less bad than the bullshitter's total disregard for truth.

Through my research in my Bullshit Studies Lab (at Wake Forest University), we've considered some additional possibilities that test this hypothesis. First, there are reasons to believe that bullshit may be more influential and persuasive than both evidence-based communications and lies. Second, there are also reasons to suspect that bullshit may interfere with memory more than lies and, thereby, have a greater impact on what people believe is true.

Persuasiveness of Bullshit

In our first experiment, we were interested in determining whether or not bullshit has a noteworthy influence on attitudes and beliefs when examined in light of a traditional persuasion procedure (Petrocelli 2021b). Over 500 college students were led to believe there was a new policy being proposed by university administrators that would require seniors to pass a comprehensive exam in their major area to graduate. Students were led to believe we were interested in surveying their thoughts and opinions about the proposed policy. Half the students read persuasive arguments in favor of the exam policy that were either *strong* (e.g., Students who graduate from schools with comprehensive exams earn more in their starting salaries) or *weak* (e.g., Duke University is doing it). Half the students were also assigned to either a *bullshit frames condition* that prefaced the arguments with comments suggesting little to no interest in available and genuine evidence (e.g., "I believe there is some research on this issue, but I'm not really concerned with the evidence") or an *evidence-based frames condition* that prefaced the arguments with comments suggesting considerable interest in the relevant evidence (e.g., "I'm really concerned with the evidence concerning this issue").

Our analysis showed clear evidence of the traditional *Argument Quality effect*, but only within the evidence-based frame condition, which suggests a cueing of central route processing (whereby persuasion can occur only when the arguments themselves are compelling). However, the lack of a traditional Argument Quality effect within the bullshit frame condition suggests that bullshitting may cue what is usually referred to as peripheral route processing (whereby persuasion can occur when peripheral cues such as the number of arguments or attributes of the communicator appear compelling; see Figure 1).

From another angle, relative to evidence-based frames, bullshit frames appeared to weaken the potency of strong arguments yet strengthen the potency of weak arguments. Such findings are quite remarkable given the arguments themselves are the very same—they only differ in what they signal about the intentions of the communicator as they pertain to their concern for truth and evidence.

Theoretically, there are two general routes to persuasion of which the route depends on the ability, opportunity, and mental resources one has at the time, as well as their general motivation to think about the content of the message. When people follow the *central route to persuasion*—because they have the ability, opportunity, and motivation to think about a

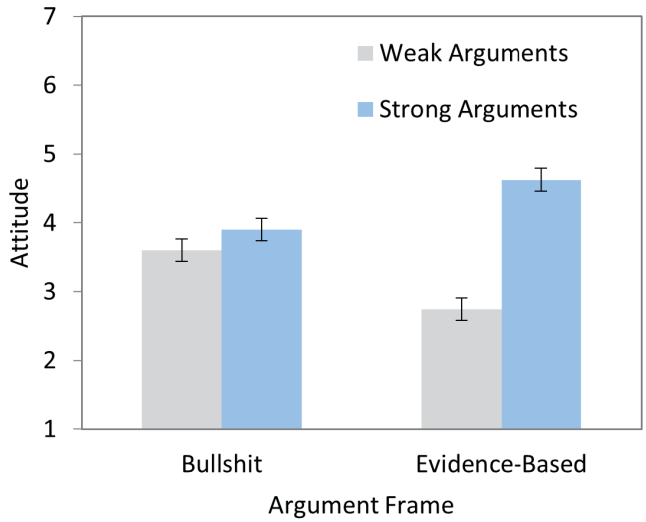

Figure 1. Attitude and Thought Favorability means by Argument Quality and Argument Frame (Experiment 1); error bars represent +/-1 standard error.

persuasive communication—they tend to listen carefully and think about the quality of the arguments presented. When people follow the *peripheral route to persuasion*—because they are either not motivated or lack the capacity to think about the arguments in a persuasive communication—they may be swayed by more superficial cues (e.g., source credibility, source attractiveness, nonverbal cues, number of arguments in the message) rather than their quality.

We conducted another experiment; this time, the attitude object was student feelings about an extended two-week Spring Break—an idea most students like (Petrocelli 2021b). We tried to persuade them this wasn't a very good idea (lower attitude scores in this experiment indicated more persuasion) with persuasive arguments allegedly provided by attractive or unattractive sources (using pictures from the Chicago Face Database).

Because evidence-based frames appeared to prompt central route processing in our first experiment, we expected Argument Quality to matter only when participants were presented with evidence-based frames of the arguments. But because Source Attractiveness typically operates as a peripheral route cue, we expected Source Attractiveness to matter only when participants were presented with bullshit frames of the arguments. As expected, Argument Quality made a difference—but only when arguments were provided in the evidence-based frames; it didn't matter when the arguments were provided in bullshit frames. What *did* matter in bullshit frames was the peripheral cue of attractiveness; attractive sources were more influential than unattractive sources when arguments were provided in bullshit frames, but the difference in attractiveness didn't appear to matter when arguments were provided in evidence-based frames.

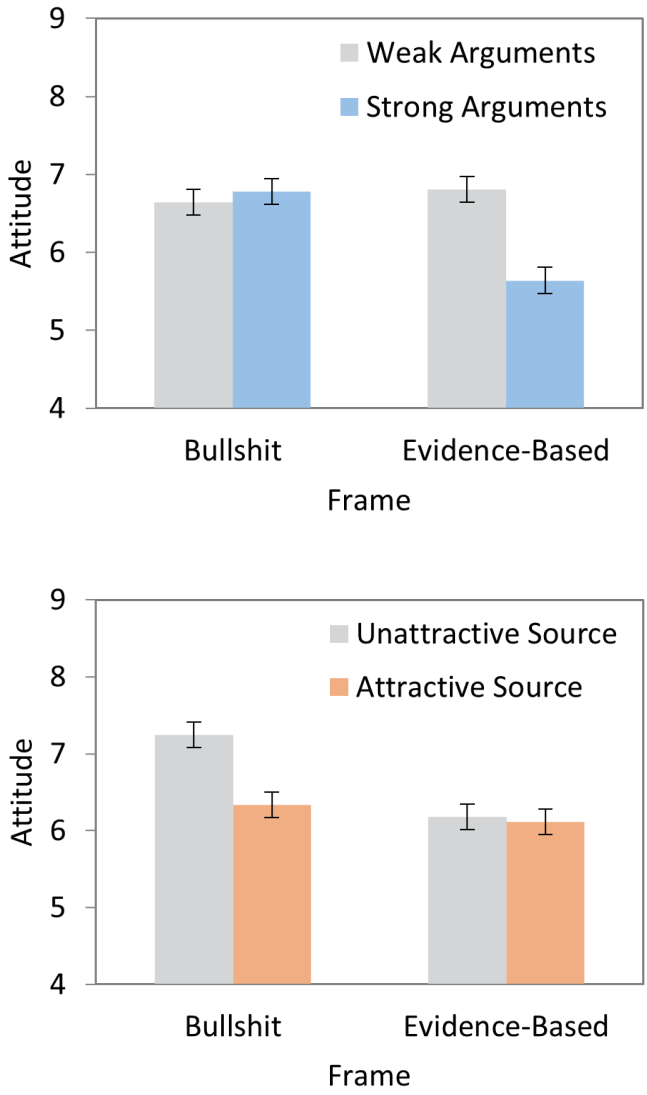

Figure 2. Thought Favorability means by Argument Frame and Argument Quality and by Argument Frame and Source Attractiveness; error bars represent +/-1 standard error. Lower scores indicate more persuasion that a longer Spring Break is a bad idea (Petrocelli 2021b).

Bullshit Sleeper Effect

We explored two additional ways in which bullshit might affect attitudes and beliefs about what is true. In our third experiment, we borrowed from a traditional sleeper effect procedure. A sleeper effect is a persuasive influence that increases, rather than decays, over time (Albarracín et al. 2017; Cook and Flay 1978; Priester et al. 1999). The easiest way to demonstrate a sleeper effect is by providing people positive information about a novel attitude object (e.g., political candidate) and showing that they express relatively positive attitudes (at least initially). Later, people are provided with contrary, negative information about the source of earlier information. In response, social perceivers tend to discount the initial information and adjust their attitudes downward (i.e., less positive). However, with nothing more than the passage of time, there tends to be an increase in persuasion such that attitudes return to a more positive valence. The sleeper effect is usually explained as a differential decay in memory—people forget the discounting cue sooner than they forget the initial persuasive message, such that the initial message retains a more persistent hold on attitudes (Pratkanis et al. 1988).

In our experiment, we presented over 200 participants with an advertisement promoting multiple, desirable aspects of a fictious pizza (Petrocelli, Seta, et al. 2023). Attitudes about the pizza were measured, and sure enough, they were overwhelmingly positive. Later on, participants were randomly assigned to one of three discounting cue conditions—one-third were informed that a consumer protection agency revealed that some of the information in the advertisement contained lies; one-third were informed that the advertisement contained bullshit; and one-third received no discounting cue at all. Attitudes about the pizza were measured once again, and, as expected, the attitudes of participants who received lies or bullshit were significantly reduced (see Figure 3). When our participants returned to our lab ten to fourteen days later, they were reminded of the attitude object we asked them to read about. Then we measured their attitude toward Ciao's Pizza

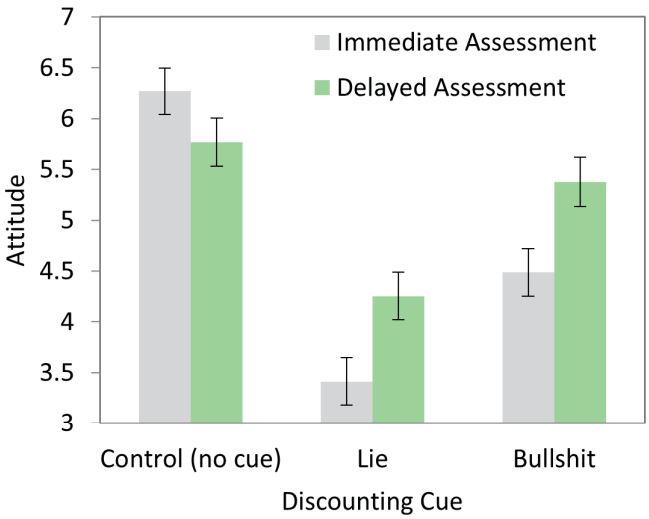

Figure 3. Attitude means for Attitude Assessment by Discounting Cue Condition (Petrocelli, Seta, et al. 2023).

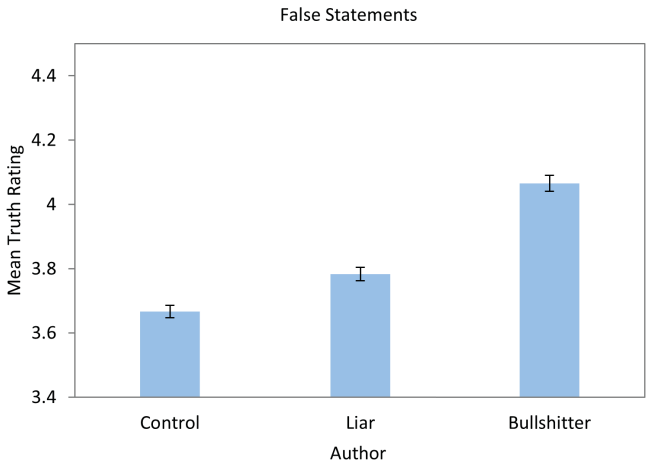

Figure 4. Mean truth ratings by Author Condition (Petrocelli, Rice, et al. 2020).

one last time.

After the delay in time, attitudes in both the lie and bullshit conditions increased. However, what we found most interesting was consistent with what we'd expect from the insidious bullshit hypothesis: Not only did the bullshit discounting cue result in more positive attitudes over time compared to the lie discounting cue, but it returned attitudes to a level of positivity that we would expect if our participants had never been given a discounting cue at all—and in a way that the lie discounting cue did not. Because bullshitting appears to produce a stronger sleeper effect for unwarranted attitudes than does lying, and attitudes are relevant to thinking and behaving, it serves as further support for the insidious bullshit hypothesis.

Bullshit Illusory Truth Effect

Our final experiment borrowed from a procedure used to demonstrate an *illusory truth effect*—the phenomenon that repeated statements are easier to process and remember (i.e., processing fluency) compared to new statements, regardless of whether repeated statements are truthful (Hasher et al. 1977). When something becomes *perceptually fluent*, it is more easily mentally processed. If we've seen something before, it's easier to recognize and easier to mentally process, and we often take the relative ease to signal truth.

It is relatively easy to produce an illusory truth effect (sometimes referred to as a repetition-induced memory) by first exposing people with everyday stimuli (e.g., names, statements) repeatedly. If an individual reads or hears the statement "Our sun is a red giant star" many times over, they are more likely to believe that statement then the truthful statement "Our sun is a yellow dwarf star." The initial exposure sets contrasts with new information not previously processed; in other words, previously processed information is more perceptually fluent than new information. This "difference" in perceptual fluency is confused for truth. The illusory truth effect can be pushed even further, as empirical research has shown that even when individuals know better, they still fall victim to the phenomenon (Fazio et al. 2015).

In our final experiment, we used stimuli such as "Steinbeck is the last name of the author of *The Agony and the Ecstasy*" (false; it's Stone). We first asked over 300 participants to simply rate how interesting they found each statement for the purpose of exposing them to some information that would be repeated again later. Later, we asked participants how true they believed similar statements were. Some of the statements were repeated, some were new, some were false, and some were true. Our participants were randomly assigned to one of three conditions in which they learned 1) the author of the statements was instructed to construct statements whereby they knew half were true and half were false (liar); 2) the author was instructed to include statements whereby they knew half were true and half were without any real concern for truth, genuine evidence, or existing knowledge (they neither knew nor cared if they were true; a bullshitter); or 3) the author was simply instructed to compile a list of statements and half the statements were true and half were false (control).

When our participants were informed that some of the information was false after the initial exposure, we observed a drop in truth ratings for the control and liar conditions that was not observed for the bullshitter condition (see Figure 4). Once again, these results are consistent with the insidious bullshit hypothesis. Not only were all the items false, but bullshit exposure did not afford the same corrective attempt observed by the liar and control conditions. The very same pattern was observed for the items that happened to actually be true. There was an overall increase in truth rating for true information—and that was good—but the differences between those exposed to bullshit, versus honesty and lies, remained.

Despite the unfortunate actions and consequences of seemingly so many victims of bullshit (e.g., Edgar Welch, the Washington, D.C., Comet Ping Pong pizzeria gunman), people often think bullshit is harmless. Yet data from our Bullshit Studies Lab has demonstrated through four controlled

experiments that bullshit can be more influential than lies and—under some conditions—even evidence-based information. These results provide support for Frankfurt's original insidious bullshit hypothesis, as well as a preliminary answer to the why question (i.e., why people engage in so much bullshitting behavior). Although bullshit may serve as a detriment to those who receive it, it can work in favor of the individual bullshitter. A just-desert would appear to be—if it be true—that bullshit may get one to the top, but it never lets one stay there (Sadhguru 2016). Downstream, negative consequences for bullshitters is a topic that awaits empirical attention. Until then, it appears that a little concern with the truth, access to readily available evidence, and perhaps treating bullshit as being as harmful as lies—until otherwise supported by evidence—will make all the difference. ■

Note

This article was adapted from a presentation at CSICon on October 22, 2023, in Las Vegas, Nevada.

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Who Believes Unsubstantiated Claims?

People who accept one type of unsubstantiated claim, such as false conspiracy theories, also tend to accept others, such as paranormal and pseudoscientific claims. They also differ in their thinking skills and cognitive styles.

D. ALAN BENSLEY AND CODY T. WATKINS

The variety of claims that people accept with little or no high-quality support is truly astounding. In the realm of religion, Hindus pray to Ganesha, a god with the head of an elephant who can, nevertheless, understand their requests as if they were talking to a human. Catholics believe that the bread and wine they consume in the Communion rite magically—and literally—changes into the body of their savior, who passed from mortal existence more than 2,000 years ago.

Politics is rife with conspiracy theories and other unsubstantiated claims. For instance, QAnon supporters incorporated into their web of conspiracies the 2016 conspiracy theory that a cabal of liberals abducts and abuses children, even sacrificing them for their blood. A primary source for their many unfounded beliefs was their interpretation of the cryptic statements of Q, an anonymous internet source, who claimed to have security clearance from the government. Many QAnon, supporters believed Q and stormed the U.S. Capitol on January 6, 2021, to save the country from liberals, falsely believing that the 2020 election had been stolen. Superstition, another kind of unsubstantiated belief, has even influenced the decisions of national leaders. Famously superstitious, the late Senator John McCain changed the floor number of his presidential campaign office from 13 because he believed it was unlucky (Wargo 2008). Politics and pseudoscience have even crept into people's decisions about medicine. Despite a conservative backlash that denied the scientific efficacy of the COVID-19 vaccines, some people quickly accepted the claim that ivermectin, a treatment for deworming horses, was effective as a treatment for COVID-19. The FDA even had to warn people against ingesting bleach when former President Donald Trump suggested that taking it internally might help fight COVID-19 infections.

Obviously, acting on various unsubstantiated beliefs can have serious negative consequences—see the January/February 2023 issue of Skeptical Inquirer for more examples (Bensley 2023). However, compounding the problem of accepting any one type of unsubstantiated claim is the fact that

Jake Angeli, the "QAnon Shaman." Image Credit: TheUnseen011101 (Wikipedia)

people who accept one type also tend to accept other types more—thus potentially greatly increasing the risk of negative consequences. This tendency for some people to endorse multiple types of unsubstantiated claims is what we call the "general endorsement of unsubstantiated claims."

This raises a basic question: Why do some people tend to more strongly endorse different types of unsubstantiated claims than other people? Perhaps some people find it more difficult to distinguish one type from another because multiple types of unsubstantiated belief sometimes overlap in the same example. For instance, people who falsely believe that the authorities are hiding chemicals in vaccines that cause autism may be endorsing three different types of unfounded claims. First, they may believe a nonexistent conspiracy is afoot among authorities to hide the connection. Second, they are showing the influence of misconceptions about the nature of vaccines and autism. In fact, thimerosal—a chemical said to be linked to autism—was not used in preserving the MMR vaccine, as was falsely claimed by some anti-vaxxers (Centers for Disease Control and Prevention 2020). Third, they are being influenced by pseudoscience when they continue to falsely believe that science found a connection. They are basing their conclusion on low-quality scientific research despite high-quality scientific research debunking the claim. Case in point is British physician Andrew Wakefield, who initially claimed a connection between the MMR vaccine and autism based on a low-quality study of only twelve children. Although Wakefield declined to replicate his findings, he and his followers continued to maintain the claim was scientifically supported.

Careful examination of the individual claims in a complex example like this one should allow someone to recognize at least one unsubstantiated claim and realize that if any part of it were unsubstantiated, that would render the example unsubstantiated. However, some people find unsubstantiated claims difficult to disconfirm and so endorse multiple ones. For more information about this overlap and difficulties in identifying unsubstantiated claims, see the aforementioned article in the January/February 2023 issue of SI (Bensley 2023).

General Endorsement of Unsubstantiated Claims

Ted Goertzel (1994) conducted one of the first studies to show general endorsement of unsubstantiated claims. He found that belief in one conspiracy theory was the best predictor of endorsement of others. Some people responded to conspiracy theories with different content as if they were the same. This may be because even though conspiracy theories show specific differences in topic and content, they may contain common themes, such as powerful people colluding for nefarious reasons to deceive the public. When certain words signal mistrust of the government, scientists, and other sources of power, conspiracy theorists may tend to accept the claims regardless of their specific content.

Studies finding generality in endorsement of different conspiracy theories show that measures of them are positively intercorrelated. In such cases, as people endorse one conspiracy theory item or measure more, they also tend to endorse other conspiracy items and measures more. For example, a person who agrees that multiple people were involved in the assassination of President John F. Kennedy would also tend to agree that the 9/11 attack on the World Trade Center was an inside job.

We found this pattern in two recent studies using a new measure of conspiracy theory belief called the Specific Conspiracist Belief (SCB) inventory, which assesses different types of conspiracy theory belief (Bensley et al. 2019; Bensley et al. 2022). The SCB contains thirty descriptions of specific conspiracies with three ten-item scales, each containing a different type. One scale contains conspiracy theories known to be false, such as the Apollo moon landings were a hoax perpetrated by NASA. A second scale contains fictitious ones that we made up, such as the claim that the government is using the Washington monument to transmit coded messages

to aliens on other planets. The third scale contains true conspiracies, such as that the CIA has sponsored research testing mind-control techniques on Americans, which actually did occur in the MK-Ultra program. As scores on each of these three SCB scales increased, so did scores on each of the other three scales. In other studies, endorsement of common conspiracy theories was positively correlated with belief in newer COVID-19 conspiracy theories (Alper et al. 2020; Bensley et al. 2023).

In further support of the general endorsement of unsubstantiated claims, several studies have found that as scores on conspiracy theory belief measures increase, scores on other types of unsubstantiated claims also increase. For instance, as people's belief in conspiracy theories increase, they are more likely to also accept paranormal claims and psychological misconceptions (Bensley et al. 2022). Numerous studies have found measures of conspiracy theory belief were positively correlated with paranormal beliefs (Brotherton et al. 2013; Darwin et al. 2011; Pennycook et al. 2015; Stahl and van Prooijen 2018) and with superstitious beliefs (Bensley et al. 2019; Swami et al. 2011). Moreover, studies have found that as belief in conspiracy theories increases, so does acceptance of paranormal claims and complementary and alternative medicine (Bensley et al. 2023; Pennycook et al. 2015). Likewise, measures of belief in other unsubstantiated claims and measures of belief in pseudoscience showed a similar pattern (Bensley et al. 2014; Lobato et al. 2014).

Taken together, these studies show that some individuals are prone to generally endorse multiple types of unsubstantiated claims. This raises questions about how the thinking of individuals who more strongly endorse such claims may differ from that of individuals who endorse them less. Specifically, do individuals who accept unsubstantiated claims show cognitive differences, such as deficiencies in reasoning skills, making it difficult to recognize unfounded claims? Or do cognitive style differences, such as certain attitudes and traits, dispose them to accept or reject unsubstantiated claims more?

Cognitive Differences Related to Unsubstantiated Belief

The tendency to endorse unsubstantiated claims more has been associated with poorer thinking skills in several studies. For example, student participants who endorsed more psychological misconceptions performed more poorly on a critical thinking skills test (Bensley et al. 2014), and others were less able to recognize examples of various thinking errors (Bensley et al. 2021). Likewise, conspiracy theory believers were more susceptible to a thinking error called the "conjunction fallacy" (Brotherton and French 2014). Paranormal believers have been prone to making ontological category errors and using heuristics or cognitive shortcuts, which can lead to bias (Pennycook et al. 2015). In a recent study, Mengcen Qian, Shin-Yi Chou, and Ernest Lai (2020) found that people who tend to initially believe in the spurious connection between vaccines and autism exhibited the thinking error confirmation bias—paying more attention to evidence that agreed with their initial position than to disconfirming evidence.

Although numerous studies have documented cognitive skill and critical thinking deficiencies in people who tend to endorse unsubstantiated claims, a person's cognitive style may be a particularly strong contributor. According to a dual-process theory of cognitive style, people have two basic cognitive styles: a rapid, intuitive-experiential style of processing and a slower, more deliberate, reflective, rational-analytic style. As you might expect, people who rely more on their intuition, feelings, and personal experience are more likely to accept unsubstantiated claims. In contrast, people who are more rational-analytic tend to reject them.

Several studies have found that people who endorse more unsubstantiated claims show a more intuitive-experiential cognitive style. For instance, more intuitive individuals tend to show greater acceptance of paranormal claims (Bensley et al. 2014; Lindeman and Aarnio 2007) conspiracy theories (Alper, Bayrak, and Yilmaz 2020; Pennycook et al. 2015), and psychological misconceptions (Bensley et al. 2014; Bensley et al. 2022). People with a more intuitive style also endorse various other types of unsubstantiated claims, such as pseudoscience, superstitions, and the claims of complementary and alternative medicine.

In contrast, because individuals with a more rational-analytic cognitive style would be expected to be more intellectually engaged and reliant on careful reasoning, they would tend to accept unsubstantiated claims less. For instance, people with lower scores on the Rational-Analytic Scale of Rosemary Pacini and Seymour Epstein (1999) and similar measures believed in paranormal and conspiracy theories more (Lobato et al. 2014; Bensley et al. 2022).

When researchers observe people rejecting paranormal claims and conspiracy theories, they often call this "skepticism" (Pennycook et al. 2015). Along these lines, Tomas Stahl and Jan-Willem van Prooijen (2018) used the Importance of Rationality Scale, thought to measure skepticism toward unfounded beliefs, along with a measure of analytic cognitive style and cognitive ability. They found that together they were negatively associated with belief in the paranormal and conspiracy theories. However, these measures were not specifically designed to measure a skeptical cognitive style and instead allowed the researchers to infer skepticism through rejection of unsubstantiated claims.

Skepticism and Cynicism

Accordingly, we sought to more directly measure skeptical cognitive style. This is important because people often confuse skepticism with *cynicism*, another and distinct disposition (French 2015). According to their commonsense psychological view, skeptics are cynical people who doubt everything, even religion and other cherished ideas. This everyday conception of cynicism also differs from the dictionary definition, which emphasizes mistrust of people and doubt of the sincerity of their motives. Likewise, skepticism means something different to scientific skeptics (skeptical inquirers) who view skepticism as an approach to claims in which a person

reserves judgment until sufficient high-quality, scientific evidence has been provided. As such, scientific skepticism can be viewed as a specific kind of critical thinking disposition, an attitude or trait that disposes a person to critically evaluate a claim related to science (Bensley 2018).

To more precisely test the contributions of cynicism and skepticism to the general endorsement of unsubstantiated claims, we recently developed new measures of cynicism and scientific skepticism. Items in the Cynicism Scale were designed to assess a negative evaluation of the motives of people, especially people in power, and a distrust of the statements of scientists and experts. In contrast, the Scientific Skepticism Scale contains items consistent with the philosophy of scientific skepticism (Kurtz 1992). Items focus on a tendency to trust scientific methods, be skeptical of information provided by the unaided senses, and maintain an open-minded attitude toward new claims but waiting to accept claims until sufficient, high-quality, scientific evidence has been provided.

Recently, we found that college students who reported being more scientifically skeptical were less likely to endorse both paranormal beliefs and false and fictitious conspiracy theories (Bensley et al. 2022). Rational-Analytic Scale scores were a less consistent negative predictor. Surprisingly, Cynicism Scale scores were a consistent positive predictor of three types of unsubstantiated beliefs, not just endorsement of conspiracy theories, as expected. Moreover, a more intuitive-experiential cognitive style positively predicted endorsement of the three measures of unsubstantiated belief. We have obtained similar results in assessing two large Spanish samples using some other measures of unsubstantiated beliefs (Bensley et al. 2023). In these same samples, people with higher scores on a measure of religiosity—reporting that they were religious and their religious beliefs affected their daily lives—also tended to generally accept unsubstantiated claims more.

In conclusion, numerous studies have shown that people differ in their tendency to endorse multiple types of unsubstantiated claims. We found that people who generally endorse unsubstantiated claims also tend to be more cynical and rely more on an intuitive cognitive style and less on a rational-analytic, scientifically skeptical approach. One implication is that efforts to help them critically examine unsubstantiated claims may require taking into account their cognitive styles. But before uncritically accepting this last claim, more scientific research is needed. ■

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The Rise and Fall of 'Havana Syndrome'

ROBERT BARTHOLOMEW AND ROBERT BALOH

On Wednesday afternoon of August 9, 2017, State Department Spokeswoman Heather Nauert walked into a press briefing and announced to the world that there had been a series of health incidents among American diplomats in Cuba. They had experienced a wide range of symptoms, from headaches and dizziness to brain fog and memory loss. As more information trickled out over the ensuing months, it emerged that a panel of experts and State Department medical personnel had concluded that the most likely cause for their symptoms was an unknown device that weaponized sound. Soon these so-called "health attacks" were given a name: Havana Syndrome. A theory emerged that the Cubans—possibly in cahoots with Russian or Chinese governments—had developed such a weapon and were using it to harass American personnel. When experts pointed out that the use of such a device under the circumstances described would defy the laws of physics, speculation turned to the involvement of a microwave weapon.

In 2018, reports began to emerge of other attacks on American government personnel in over a dozen countries, including Germany, Poland, Vietnam, Uzbekistan, and Colombia. By 2021, the State Department issued its own alert to its 2.9 million military personnel and civilian staff, informing them that it was their patriotic duty to report "anomalous health incidents" they may have experienced in recent years. As a result, the number of reports quickly mounted to well over 1,000.

Fast-forward to March 1, 2023: The National Intelligence Council announced that five different intelligence agencies had concluded it was "highly unlikely" the health incidents were the result of a foreign adversary or inadvertent exposure to a directed energy device (National Intelligence Council 2023). Over the past six years, the confusion over the status of Havana Syndrome can be summed up in seven words: bad government, bad science, and bad journalism.

Bad Government

For its role, State Department medical personnel jumped on the sonic weapon bandwagon early on without adequate evidence. Last year, eager to show they cared about their diplomatic corps, Congress even approved the HAVANA (Helping American Victims Afflicted by Neurological Attacks) Act, which was signed into law by President Joe Biden. It earmarked millions of dollars in compensation for victims of what turned out to be an imaginary condition. There are no clear medical criteria for the diagnosis. This is not to suggest that those affected are mentally disturbed or faking: most were certainly experiencing real symptoms, but the origin was not from a directed energy weapon. Earlier this year, the CIA noted that most cases were the result of existing medical conditions, environmental factors, and anxiety. At the time, they

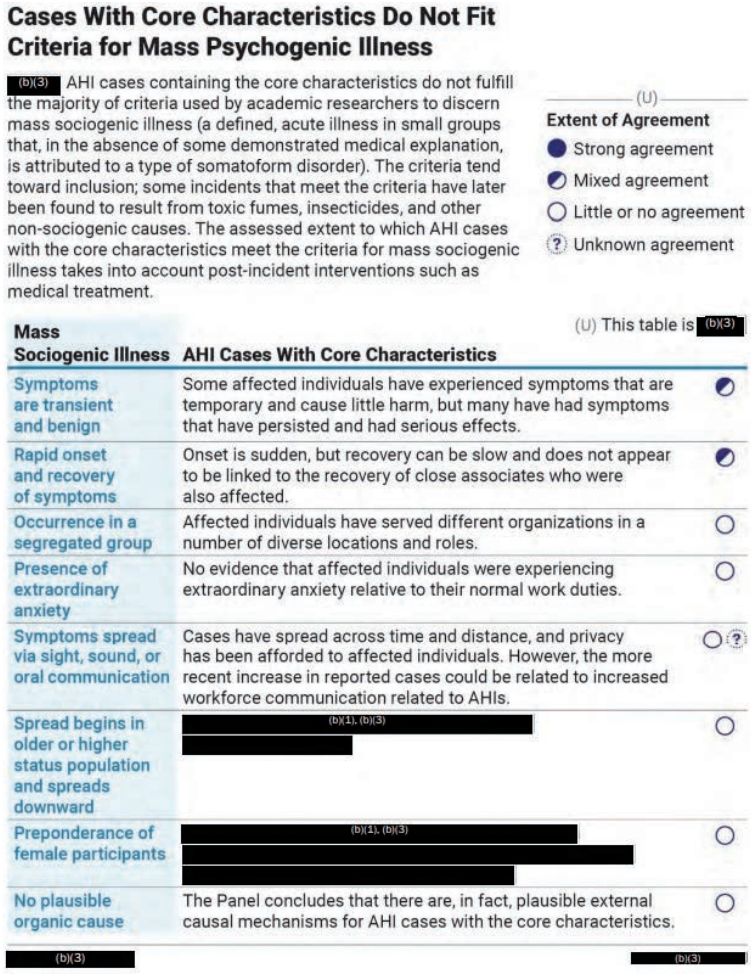
observed that a small number of reports fell into the category of being "unexplained" (Dilanian and Lederman 2023). Despite some media outlets focusing on this aspect of the report, this simply meant that there was insufficient information with which to make a firm assessment—a situation reminiscent of past government reports on UFOs. There will always be UFO cases that are unable to be adequately assessed due to a lack of information. This should not be taken as evidence people are being abducted by space aliens! Another issue was the mixing of politics with science. In September 2021, the head of the Biden panel overseeing Havana Syndrome, Pamela Spratlen, was forced to resign after she refused to rule out mass psychogenic illness as a possible cause (Lederman and Breslauer 2021). This was a clear signal that the government's investigation was being driven by politics instead of science.

Bad Science

A 2018 study in the *Journal of the American Medical Association* used a threshold for impairment of victims of 40 percent, an extraordinarily high figure. This prompted the editor of the journal *Cortex*, neuropsychologist Sergio Della Sala, and the entire editorial board to call for the authors to clarify their methods or retract the study. When they subsequently attempted to defend this figure, Della Sala described it as so ambiguous as to be incomprehensible (Cortex Editorial Board 2018; Della Sala and Cubelli 2018). The following year, another study in the same journal identified brain anomalies in some of the American diplomats from Cuba. This was widely misreported in the media as brain damage, but they are not equivalent. In fact, such minor anomalies are common in normal cohorts and were consistent with people under prolonged stress.

One of the most alarming derelictions of scientific objectivity were the actions of the National Academies of Sciences panel, which observed that it could not assess the possible role of mass psychogenic illness because it was unaware of *any* epidemiological evidence on the pattern of social contacts that would allow it to assess the possible role of social contagion (National Academies of Sciences 2020). They specifically noted the absence of data on the index case (i.e., the first person affected). Six months earlier, we had described the spread from patient zero in our book on the subject (Baloh and Bartholomew 2020). Investigative journalists Tim Golden and Sebastian Rotella had obtained and published this information in *Propublica* in 2018 and 2019. Golden, a two-time Pulitzer Prize winner, and his colleague described the early spread in considerable detail and identified patient zero. The panel's omission of this crucial information from its report is as mystifying as its conclusion that the victims were likely attacked by pulsed microwave radiation—despite providing no evidence for any such attack.

In September 2022, a small, independent panel of experts commissioned by the U.S. government reached similar findings as the Academies: pulsed microwave radiation was a plausible explanation (Declassified 2022). What—in addition to their conclusions—do the National Academies of



Cases With Core Characteristics Do Not Fit Criteria for Mass Psychogenic Illness

[redacted] AHI cases containing the core characteristics do not fulfill the majority of criteria used by academic researchers to discern mass sociogenic illness (a defined, acute illness in small groups that, in the absence of some demonstrated medical explanation, is attributed to a type of somatoform disorder). The criteria tend toward inclusion; some incidents that meet the criteria have later been found to result from toxic fumes, insecticides, and other non-sociogenic causes. The assessed extent to which AHI cases with the core characteristics meet the criteria for mass sociogenic illness takes into account post-incident interventions such as medical treatment.

(U)
Extent of Agreement
Strong agreement
Mixed agreement
Little or no agreement
Unknown agreement

(U) This table is [redacted]

Mass Sociogenic Illness	AHI Cases With Core Characteristics	
Symptoms are transient and benign	Some affected individuals have experienced symptoms that are temporary and cause little harm, but many have had symptoms that have persisted and had serious effects.	Mixed
Rapid onset and recovery of symptoms	Onset is sudden, but recovery can be slow and does not appear to be linked to the recovery of close associates who were also affected.	Mixed
Occurrence in a segregated group	Affected individuals have served different organizations in a number of diverse locations and roles.	Little or no
Presence of extraordinary anxiety	No evidence that affected individuals were experiencing extraordinary anxiety relative to their normal work duties.	Little or no
Symptoms spread via sight, sound, or oral communication	Cases have spread across time and distance, and privacy has been afforded to affected individuals. However, the more recent increase in reported cases could be related to increased workforce communication related to AHIs.	Little or no / Unknown
Spread begins in older or higher status population and spreads downward	[redacted]	Little or no
Preponderance of female participants	[redacted]	Little or no
No plausible organic cause	The Panel concludes that there are, in fact, plausible external causal mechanisms for AHI cases with the core characteristics.	Little or no

[redacted] [redacted]

The report's criteria for mass psychogenic illness rejected extraordinary stress as a key factor in the Cuban outbreak on the assumption that their training inoculated them against the effects of anxiety.

Sciences and this small panel have in common? Both investigations were overseen by Stanford University Microbiologist David Relman. It is not hard to see why the five separate intelligence agencies would have rejected the findings of these panels. Both discard the psychogenic illness explanation in part because they deemed that the affected diplomats and intelligence officers were not under exceptional stress because they were trained in security and therefore should have been able to handle the pressure. Really? When posted to Cuba, the Americans were told there is a long history of Cuban agents harassing American staff and that they would be under constant surveillance. Furthermore, by early 2017, they were warned by senior management at the embassy that they may be the victim of a sonic attack, so they shouldn't stand or sleep near windows. Staff would later acknowledge that this state of affairs (and psychological priming) left them frightened, especially those who had their families with them.

Bad Journalism

This case was marred by sensational headlines about white matter tract changes in the brains of those affected and claims of hearing loss. Both claims proved erroneous. While one

study identified white matter changes on MRI in a small cohort of American diplomats serving in Cuba, two were mild and one was moderate. This was well within the normal range. White matter tract changes are common with many conditions, ranging from migraine to depression to normal aging. In 2018, a news leak about a yet-to-be released study of twenty-five diplomats claimed that about one-third had hearing loss. When the study was eventually published, it found hearing loss in only two subjects—both of whom had preexisting hearing loss *before* they were posted to Cuba (Baloh and Bartholomew 2020). Throughout much of this saga, many media outlets concentrated on interviewing outliers, specifically scientists who believed in the existence of an energy weapon. While this makes for exciting reading, it is not an accurate reflection of the position of the mainstream scientific community. You can always find a scientist who believes in Bigfoot or that global warming is a natural cycle and not caused by humans pumping carbon dioxide into the atmosphere.

Compensation for a Socially Constructed Condition

This would not be the first time that victims of a dubious condition have received compensation. During the 1980s, keyboard operators in a certain region of Australia experienced an epidemic of over-use injuries dubbed repetition strain injuries (or RSI). However, keyboard operators in other countries had dramatically lower numbers of neuromuscular complaints. This was also true for other regions of Australia. There is now considerable evidence that those affected were experiencing an array of mundane symptoms that Australian medical community and victims attributed to a new cause. Others were suffering from anxiety. Complicating matters was the lure of potential compensation payouts (Bell 1989; Lucire 1986).

During the nineteenth century in the early days of rail travel, accidents were common, resulting in a flurry of claims by British passengers seeking compensation for spinal injuries. Many victims walked away with no obvious physical injury only to later report an array of symptoms such as back pain and headaches; this became known as "railway spine." Despite a lack of objective evidence confirming the condition, it was widely accepted in the medical community that the victims were suffering from inflammation of the spinal cord resulting in spinal compression. A consensus eventually emerged that the symptoms of railway spine were in fact the result of psychological trauma (Jones and Wessely 2005, 2).

Havana Syndrome, RSI, and railway spine all feature a lengthy list of ambiguous, commonly reported symptoms, yet governments saw fit to offer the victims compensation. Even after the new scientific consensus emerged that each condition was a social construction, a small number of scientists continued advocating for the old paradigm, refusing to admit their error, perhaps out of embarrassment or the belief it could harm their reputation. There is even a name for this behavior: belief perseverance, a form of confirmation bias whereby people select certain information and ignore contrary material that does not support preexisting views. The history of science is replete with examples where scientists have advocated for a particular position only to have their claims discredited. Instead of admitting this, they refuse to accept the consensus of the scientific community and continue to double down on their claims.

In 1923, American sociologist William Isaac Thomas wrote, "If men define situations as real, they are real in their consequences" (Thomas and Thomas 1929). This is not more evident than in the case of Havana Syndrome. Instead of letting the evidence drive their beliefs, people too often let their beliefs drive the evidence. This resulted in people seeing what they wanted to see. When you add politics and lawyers to the mix, that helps to explain why it has taken over six years to resolve. ■

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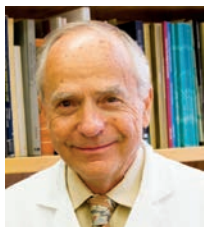

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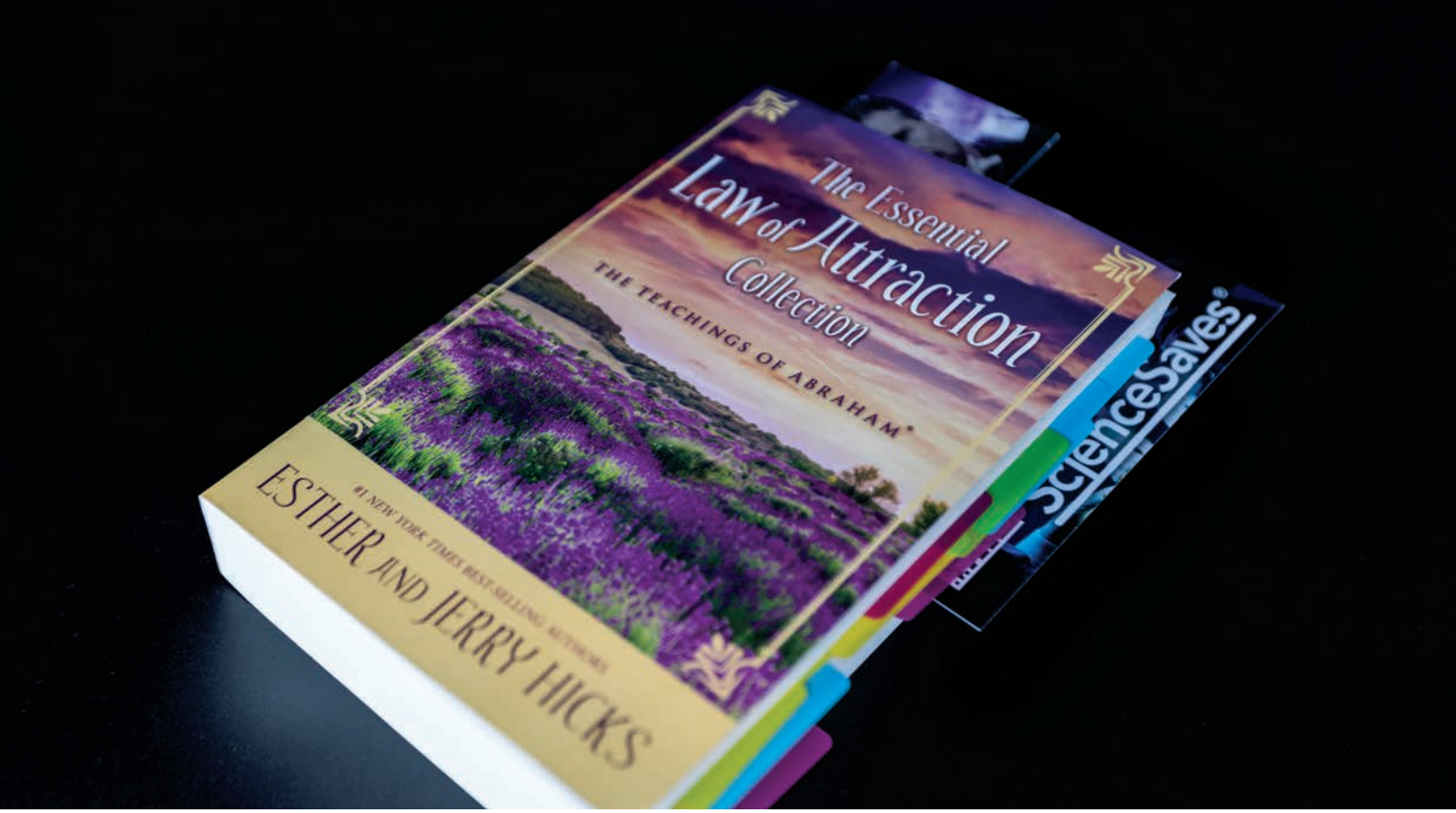


Abraham-Hicks: Motivational Speaking Spirits

The strange story of Abraham-Hicks involves motivational spirits who teach about the pseudoscientific Law of Attraction via self-proclaimed Ouija board named Esther Hicks.

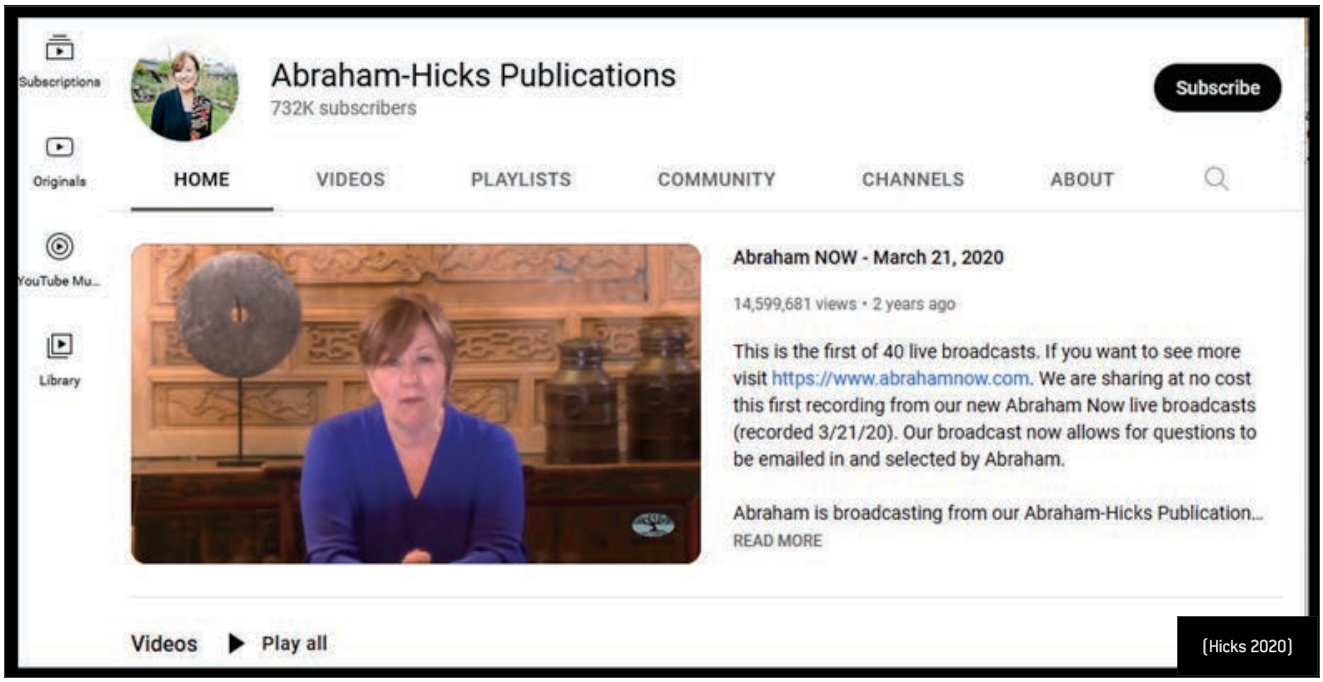
ADRIENNE HILL

In October 2022, my husband and I were fortunate to be able to embark on a Mediterranean cruise, twice canceled because of COVID-19. We were surprised to encounter more pseudoscience than we had previously experienced on cruises. There were the usual spa offerings, including acupuncture and Gwyneth Paltrow's Goop-inspired products and therapies. But we also discovered something neither of us had heard of before.

The first night we met a friendly fellow at the bar who inquired if we were attending the Abraham-Hicks workshops. "Abraham-who?" we asked, and he vaguely alluded to workshops of a motivational nature. Our curiosity was piqued, and shortly afterward, I Googled "Abraham-Hicks." There was nothing on this strange double-barreled moniker. However, the name Esther Hicks popped up. On her Wikipedia page—tagged for a lack of citations—I learned that Esther Hicks channels a group of entities she calls "Abraham." Over the next few days, we encountered other proponents of this calling. Although we chatted with several of them, when they discovered that we weren't partaking, our conversations would quickly end.

I couldn't just let this go, and upon returning home, I purchased *The Essential Law of Attraction Collection*, a book written by Esther and Jerry Hicks. I also discovered and watched multiple YouTube videos. I soon wondered if the reason our fellow cruisers clammed up was due to the incredulous reactions they get if they divulge what Abraham-Hicks is about or an attempt to avoid our negative vibrational energy.

According to the ship's captain, we were at 60 percent capacity, with around 1,800 passengers aboard. How many were Abraham-Hicksers? Unsolicited, multiple groupies offered numbers between 800 and 1,000. One sea day, I peeked into the theater where they had gathered, and it was full. Given the capacity of 1,347 (Celebrity Cruises n.d.), the numbers seemed plausible. Upon doing a nonscientific and clandestine count of a group of Abraham-Hicksers in the buffet one day, I was saddened—but not surprised—at a ratio of about six females to every one male. In 2007, reporter Robert Chalmers attended their workshop and reported that of the approx-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(Life Journey Reservations 2022)

imately 200 attendees, 80 percent were women (Chalmers 2007), consistent with my informal finding.

By coincidence, post-cruise I headed to CSICon in Las Vegas. I asked all my skeptical friends if they had ever heard of Abraham-Hicks or Esther Hicks. No one had. Yet according to Wikipedia, Esther and Jerry Hicks have written thirteen books since 1988, three of which are for children. *Money, and the Law of Attraction* was number one on *The New York Times* Best Sellers List for the week of August 31, 2008, and *The Vortex* was number seven in 2009. On Amazon.com it states:

> Esther and Jerry Hicks are the authors of over 700 books, DVDs, and CDs, including the New York Times #1 bestseller *Money, and the Law of Attraction*. Together they deliver the teachings of Abraham, a joyful, loving, and witty non-physical group consciousness whom Esther calls "infinite intelligence" and Jerry calls "the purest form of love I've ever encountered."

Hay House, well-known for printing topics involving alternative medicine, astrology, and self-help, publishes the books.

As of January 2023, the YouTube channel for Abraham-Hicks Publications has 741,000 subscribers (up from 731,000 when I checked in November 2022) (Abraham-Hicks Publications 2023), and the featured video *Abraham NOW—March 21, 2020* has over 14.6 million views (Hicks 2020). Their website offers a variety of subscriptions for regular monthly recordings, live and in-person workshops, and cruises. On a recent New Zealand cruise, $450—on top of your cruise fare—got you thirteen hours of workshop time. It was sold out (Life Journeys 2022).

Esther and Jerry Hicks, Early Lives

Information about the Hickses' early lives is difficult to find. My primary source was an interview by Robert Chalmers for the *Independent* in 2007. In the discussion, the Hickses expressed how they turned down interviews despite being asked by many, including Larry King. One (unsurprising) exception was Oprah Winfrey, who featured Esther in her radio program, talking about the Universal Law of Attraction (Chalmers 2007).

During the Chalmers interview, Esther stated she was raised in Park City, Utah. When she was twenty, she married an unnamed authority figure. Jerry said that he grew up in San Diego and Arkansas. He spent two years as an acrobat for a circus in Cuba, followed by twenty years as an entertainer under the name "Jerry Hickson." He declared that he had "lost track of" the number of times he had been married (Chalmers 2007).

The two met in 1976 in Fresno, California, when Esther

attended an Amway presentation run by Jerry, a top performer for the organization. Esther was a bookkeeper, and both were still married to other people at the time. Four years later, they wed in Phoenix (Chalmers 2007).

Finding Abraham

The Essential Law of Attraction Collection combines three of Esther and Jerry's writings into one volume: *The Law of Attraction: The Basics of the Teachings of Abraham*; *Money, and the Law of Attraction: Learning to Attract Wealth, Health, and Happiness*; and *The Vortex: Where the Law of Attraction Assembles All Cooperative Relationships*.

In the first book, they take turns describing their journey to discovering Abraham. In 1959, an entity told Jerry via Ouija board to read books by Albert Schweitzer. This experience indicated to Jerry that other avenues of communication were possible. In 1965, he discovered what he called a life-changing book by Napoleon Hill, *Think and Grow Rich!*, originally published in 1938.

After Esther and Jerry were married, Jerry discovered *Seth Speaks* by Jane Roberts. "Seth," a spirit entity, would speak to Roberts while she was in a trance. Seth's ideas were dictated into a popular series of books that remain in print. Esther was initially afraid of Jerry's Ouija board encounters and his reading of Roberts's books but eventually overcame her fears, and they began to read the Seth books together every day.

The couple discovered another channeler named Sheila through a friend's recommendation. Sheila, who claimed to channel an entity called "Theo," was visiting Phoenix, and the couple booked an appointment. Theo informed the couple that they too were channelers and would be contacted by an entity (Hicks and Hicks 2013). "Theo said: *We are told it will be given to you directly. You will have a clairaudient experience, and you will know*" (Hicks and Hicks 2013, 20).

Sheila and Marcus Gillette currently have a website selling two books, live and recorded mentorships, meditations, and travel experiences, all supposedly guided by Theo, who, according to the website, is "12 archangel beings, speaking in one voice, here to be mentors and teachers." It appears that Esther still maintains a relationship with Sheila and Theo because Esther gives a video testimonial on the home page and a written one in the "About" section (AskTheo n.d.).

After their initial meeting with Sheila and Theo, the pair meditated daily, with Esther having increasingly more profound experiences, until one day the entity contacted her. She didn't recognize it as an entity until she realized that her head was moving and her nose was spelling out letters. They were excited when the entity spelled, "I am Abraham. I am your spiritual guide. I love you. I am here to work with you" (Hicks and Hicks 2013, 22).

For months, Abraham answered Jerry's questions via this cumbersome communication method. Next, Abraham communicated through Esther via typewriter. They claimed that Esther's fingers moved so quickly they could hardly be seen. (As it happens, my mother was a court reporter, the fastest typist I have ever known, and a winner of many typing competitions. I could definitely see her fingers moving, even though such a flurry would occasionally destroy typewriters. I am curious if Abraham could also conduct repairs on the go.) Esther's initial typing was random until "iwanttotypeiwanttotypeiwanttotype" appeared (Hicks and Hicks 2013, 23). After a couple of months, Abraham started using Esther's voice. While driving down the highway one day, just when it appeared they were about to be squeezed by two eighteen-wheelers, Abraham spoke through Esther, telling Jerry to take the next exit. They were saved! They kept their enlightenment to themselves for a year or so, worried about people's responses, but eventually began sharing with friends, who also began communicating with Abraham via Esther. She noted, "One day I laughed so hard at this realization: 'I was so afraid of the idea of the Ouija board, and now I am one'" (Hicks and Hicks 2013, 24).

The *Law of Attraction* describes the question-and-answer sessions that Jerry and Abraham had using Esther as the conduit. This led to the idea of documenting Abraham's teachings, which include three "Eternal Universal Laws" (Hicks and Hicks 2013).

The Law of Attraction: The most powerful of the laws. Participants create their own reality by focusing their thoughts on generating vibrations that allow the Universe to respond. Positive thoughts generate positive vibrations. Yes, Universe. This is capitalized throughout, regardless of usage.

The Science of Deliberate Creation: What you think about is what you get, whether good or bad.

The Art of Allowing: You have the power, through your thoughts or attention, to invite people into your life.

The Law of Attraction and *The Secret*

The Law of Attraction is nothing new. According to Mitch Horowitz in *Occult America* (2009), Andrew Jackson Davis wrote of the Law of Attraction in *The Great Harmonia* in 1866, describing different spheres of the soul after death. The concept was transformed over time into the idea that thoughts manifest events. It can be found in the 1906 publication *Thought Vibration or the Law of Attraction in the Thought World* by William Walker Atkinson. This work was the basis of the denial of the Hicks' 2006 application to trademark *The Law of Attraction*, as the phrase had been used since at least 1906 (United States Patent and Trademark Office 2009).

Many motivational gurus have incorporated the Law of Attraction into their presentations. Google it, and you will find some well-known names, including Tony Robbins and Rhonda Byrne. My CSICon friends were familiar with Byrne, or at least her Oprah Winfrey–promoted "documentary" video and best-selling book, both titled *The Secret* (Byrne 2006; Heriot 2006).

What most don't seem to know is that Esther was the narrator and inspiration for the original version of the documentary. However, after a legal dispute, she was removed and replaced by other gurus of the Law of Attraction. In a YouTube video titled *Abraham: THE SECRET BEHIND "THE SECRET"—Esther & Jerry Hicks*, Esther, while speaking in

her usual third person, explained how Byrne wanted them to sign over their intellectual rights after their hope of airing the documentary on an Australian network didn't materialize, and they were forced to look at different avenues of marketing the video. They did not want to give up those rights, and despite advice from their lawyer to sue, the Hickses decided against this path due to the amount of negative energy required, which would have taken away from their focus on teaching the Law of Attraction (Hicks 2007; Salkin 2007).

The duo continued to give workshops in many cities on the Law of Attraction until "In November 2011, Jerry made his transition into Non-Physical, and now Esther continues to conduct the Abraham workshops with the help of her physical friends and co-workers and, of course, with the Non-Physical help of Abraham and Jerry" (Hicks and Hicks 2013, 626).

What's the Harm?

A disturbing passage in the Law of Attraction section of the book seems like victim-blaming:

> People often explain, in the midst of unwanted things occurring in their experience, that they are certain they did not create such a thing. "I wouldn't have done this unwanted thing to myself!" they explain. And while we know that you did not deliberately bring this unwanted thing into your experience, we must still explain that only you have caused it, for no one else has the power to attract what comes to you but you. By focussing on this unwanted thing, or the essence of it, you have created it by default. Because you did not understand the Laws of the Universe, or the rules of the game, so to speak, you have invited unwanted things into your experience through your attention to them. (Hicks and Hicks 2013, 38)

I think these are dangerous sentiments that victims of rape, money scams, flooding, fire, or childhood or adult cancer would disagree with. Benjamin Radford and Mary Carmichael, in their Skeptical Inquirer article "Secrets and Lies," describe this victim blaming as an "ugly flipside: if you have an accident or disease, it's your own fault. … If an airplane crashes, does that mean that one or more of the passengers brought that on himself? Do soldiers killed in Iraq simply not think enough positive thoughts?" (Radford and Carmichael 2007). I can't imagine the guilt, despair, and frustration that a believer must feel when disaster strikes or success is elusive. It seems likely that there are advocates of the Law of Attraction who are successful in getting fitter, richer, and happier, who judge others negatively if they don't achieve the same level of "success." Empathy goes out the window.

In a YouTube video called "Abraham Hicks. She Wants to Know about Mental Health Disorders," Esther claims to be able to help people with psychological problems and advises against seeking help from professionals, stating that things will only get worse unless they learn about the Law of Attraction (Hicks 2014). Of greater concern is discovering professionals who are using these pseudoscientific theories. I found two examples quite easily. In the above-mentioned video, a mental health professional seeks guidance on helping her patients understand the Law of Attraction. Also, Dr. Adeline Twigge, an educational psychologist from South Africa, wrote a newsletter expounding the virtues of Esther Hicks and her methods (Twigge 2022).

Manifesting

The Abraham-Hicks principles of the Law of Attraction and deliberate creation are very similar to one of the more recent trends in self-help called "manifesting." A recent book by Roxie Nafousi (2022) titled *Manifest: 7 Steps to Living Your Best Life* became an international bestseller (Schaffner 2022). Amazon.com is full of books and guided journals on this topic. Is this idea new? No, manifesting is also advocated in *The Secret*. As reported by Dr. Anna Katharina Schaffner in her *Psychology Today* article titled "The Problem with Believing in Manifesting," manifesting is no different from the principles of the Law of Attraction (Schaffner 2022). The term *manifesting* is used in all three books in the *Essential Law of Attraction Collection*, including one heading in book two: "Attracting Money and Manifesting Abundance" (Hicks and Hicks 2013). Plus, the website lawofattractionexplained.com explicitly states, "The Law of Manifestation also called the Law of Attraction, is a universal law that asserts that what you put your focus on, you manifest more of that" (Jones and Gruber 2023).

Lucky Girl Syndrome

Yet another name for the Law of Attraction, the Secret, or manifesting that recently came to my attention and is trending on TikTok and Instagram is called "lucky girl syndrome." On these sites, people profess how lucky and prosperous they are just by thinking they will be lucky and prosperous (Mudge 2023). Laura Galebe, with over 200,000 followers, was my first hit when I searched for lucky girl syndrome on TikTok. Invoking an unknown neuroscientist's suggestion plus her own twist, she decided that if she woke up in the night, she would repeat four or five times the phrase, "I'm so lucky, great things always happening to me unexpectedly." According to Galebe, the change has been dramatic. She doesn't say specifically what has changed, other than she has "a nice surprise" happening to her every day. She professes everyone should do this because "you have nothing to lose, it's backed up by science, it works for me so why wouldn't it work for you??" (Galebe 2023). In an interview for Live Science, psychologist Robert West equated the lucky girl syndrome to a gambler's lucky streak or when people's gut feelings happen. People readily forget all the misses that occur before the hits. West states that having a positive outlook can be helpful, but "The danger of believing that we can achieve things just by imagining them is that it actually stops us doing the things that would make our lives, and those of other people, better" (Mudge 2023).

With these many variations of names over time, I wonder if the positive thinking leaders are trying to set themselves apart by using different terms to describe the same or similar things to keep their profits rolling in.

Conclusion

Schaffner (2022) states that although optimistic thinking has been shown to promote better life outcomes than pessimis-

Picture taken from the cruise ship by Adrienne Hill

tic thinking (see, for example, Richard Wiseman's book *The As If Principle*), those who advocate the Law of Attraction make outlandish claims that extend far beyond the research. The wellness gurus invoke quantum physics and the universe, claiming that the mind can heal and bring you riches if you want it badly enough. Schaffner sums up the problem beautifully:

> While reading these kinds of books may make us feel temporarily hopeful, perhaps even giddily expectant, reality will inevitably catch up with us. We will end up feeling worse, not better, when our promised riches fail to arrive. Not a single one of our problems will have been resolved. (Schaffner 2022)

This rabbit hole I have journeyed down started on a chance encounter on a cruise that I was grateful to have the opportunity to be on. Gliding on the sea, traveling to beautiful cities, eating amazing food, and conversing with my husband and new friends left me feeling fulfilled and fortuitous. No Law of Attraction, manifesting, or Secret needed. I'm one lucky girl. ■

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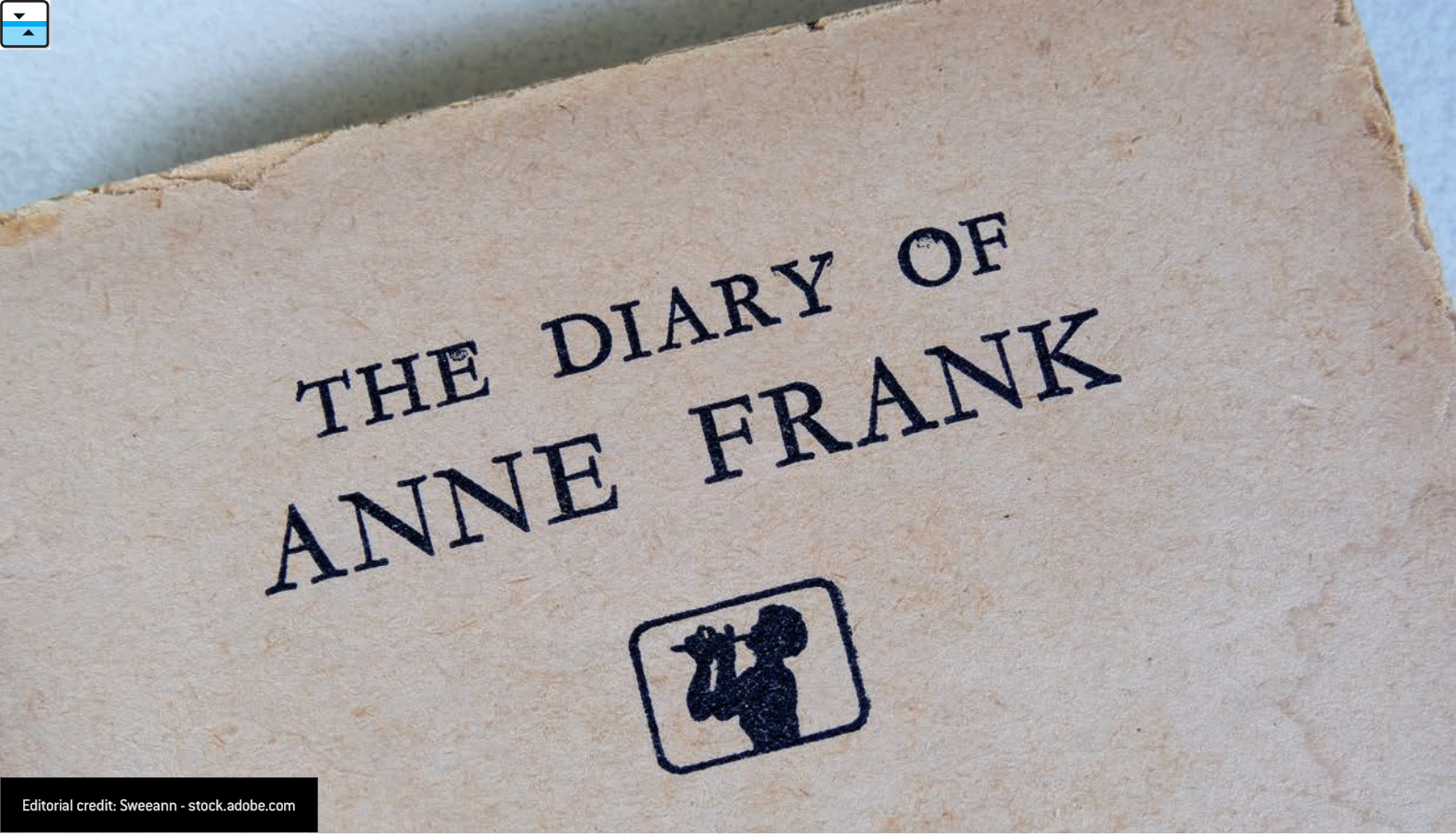

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Who Betrayed Anne Frank? A Cold Case Study

JOE NICKELL

In Amsterdam, Jewish schoolgirl Anne Frank (with her family and others—eight in all) hid from the Nazis in concealed rooms for two years, until someone betrayed them. At least thirty persons have been considered, most recently a fellow Jew, which has provoked much scholarly doubt. Here an investigator looks again at a more likely suspect—mentioned by Anne Frank herself in her famous diary.

Anne Frank was born Annelies Marie Frank on June 12, 1929, in Frankfurt, Germany. A Jewish victim of the Holocaust, she gained fame posthumously when her narrative, *The Diary of a Young Girl*, became one of the world's most celebrated books. It is essentially her account of two years in hiding (with her family and four others) in Amsterdam. They lived in rooms whose only entrance was behind a bookcase that served as a secret panel.

After more than two years, the hiding place was raided by plainclothes police led by a Nazi security service officer. The eight secret inmates were interrogated and sent to the Westerbork transit camp; from there they were transferred to the Auschwitz death camp, from which they suffered various fates. Only Anne's father, Otto, would survive. Her mother starved herself to feed her two daughters. Later transferred to Bergen-Belsen concentration camp, the older girl, Margot, died, followed days later by Anne—in February or possibly March 1945 ("Anne Frank" 2022). Anne's story precedes this postscript of tragedy.

The Diary

Anne Frank received the diary in the summer of 1942, after the systematic deportation of Jews from the Netherlands had begun. She had first admired it on display in a local bookstore's window. Finally, she had the red-checked diary in her hands on June 12, her thirteenth birthday. She named it "Kitty" only twenty-four days before the family would go into hiding (Perricone 2019, 22–33).

While most sources label the volume a "diary," others insist it was actually intended for autographs ("Anne Frank" 2022)

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or was even "technically an autograph book" (Perricone 2019, 23). It is unlabeled, but we can clarify these issues (see Nickell 1990, 145, 151–155, 158, 176–177). A new diary often bears printed dates or pages lined for writing, but many like Frank's do not, and so those may be used for collecting autographs. However, one feature of Frank's book—a combined strap and lock—is clearly intended for privacy and so indicates a diary. Besides, ultimately a volume becomes whatever it is used for, and Frank settled the matter herself: she wanted a diary because she wanted to learn to become a writer.

Although the diary's authenticity is established (more on this presently), it is well to keep in mind that it exists in three versions: (1) the original diary; (2) Frank's rewritten journal—done in her last months in the hideout with her ambition for it to be published; and (3) the rewritten diary, with factual and tactful edits subsequently made by Otto Frank or done under his supervision—essentially the version published around the world (Sullivan 2022, 36–37). (See, for example, Frank 1991.)

Despite repeated attempts of Holocaust deniers and Nazi sympathizers to brand the diary a forgery ("Anne Frank" 2022), it has also been repeatedly authenticated—by a court in 1960, for instance. The handwriting was found to match that in letters known to be Anne Frank's ("Anne Frank" 2022). Upon Otto Frank's death in 1980, the original diary, together with letters and individual sheets, was bequeathed to the Dutch Institute for War Documentation. This institute subsequently commissioned a complete forensic examination in 1986 (through the Netherlands Ministry of Justice). Experts concluded the handwriting matched known exemplars and the glue, paper, and ink were consistent with the time of writing. These findings were published in a "Critical Edition" of the diary (Prose 2009, 247–248).

Hiding in Amsterdam

The Frank family narrative takes place in Amsterdam. In 1933, Otto Frank moved from Germany to the Netherlands, where he had been employed to organize Opekta Works, a company that sold the fruit extract pectin. His wife, Edith, soon joined him, followed by their oldest child, Margot, then Anne (who had been staying with her grandmother).

The four were among some 300,000 Jews who fled Germany. When the Nazis invaded the Netherlands in 1940, the occupiers implemented their fascist policies of discrimination, forced registration, and segregation. Otto Frank's attempt to have his family emigrate to the United States failed, and (as mentioned) in 1942 the occupiers started deporting Jews from the Netherlands.

On July 5, Margot received a notice ordering her to report to a work camp where she was being relocated. Instead, the Franks simply moved forward by ten days their plan to go into hiding. Originally intended for the sixteenth, they actually moved into their hiding place on the morning of Monday, July 6, 1942.

Known in the diary as *Het Achterhuis* (literally "the back house")—or "secret annex" in English translation—their hiding place consisted of a three-story concealed wing of Otto's Opekta offices. The four Franks were soon joined by a family of three, the van Pels: Hermann, Auguste, and their sixteen-year-old son Peter; in November, the eighth and final member of the group came: Fritz Pfeffer, a dentist and family friend. The eight divided the hidden premises into two apartments for the duration. At least eight more knew of the hiding place—they were four of Otto's employees called "helpers" (Johannes Kleiman, Victor Kugler, Bep Voskuijl, and Miep Gies) and their family members (Miep's husband, Jan; Bep's father, Johannes; Kleiman's wife, Johanna; and Klieman's brother, Willy, who served as annex repairman) (Sullivan 2022, 56, 82–83).

The Opekta offices were part of a warehouse complex located at Prinsengracht 263 (one of the main canals in central Amsterdam). The secret annex's three stories were entered from a landing above the business offices. Here the eight lived as Jews in hiding for over two years as chronicled in Anne Frank's diary.

She was pleased to have new people to interact with, but the confinement naturally brought tensions—as well as a budding romance with Peter van Pels, from whom she received her first kiss. She closely bonded with each of the "helpers," impatiently awaiting their daily visits. These loyal friends helped in countless ways—from the increasingly difficult task of supplying food to the perpetually frightening challenge of ensuring everyone's safety, including their own.

We watch—and listen to—Frank, as she slowly matures. On Wednesday, April 5, 1944, she writes:

> I *know* I can write. A few of my stories are good, my descriptions of the Secret Annex are humorous, much of my diary is vivid and alive, but … it remains to be seen whether I really have talent. …
>
> Unless you write yourself, you can't know how wonderful it is;

> I always used to bemoan the fact that I couldn't draw, but now I'm overjoyed that at least I can write. … I don't want to live in vain like most people. I want to be useful or bring enjoyment to all people, even those I've never met. I want to go on living even after my death!

The Raid!

And then—on Friday, August 4, 1944, after more than two years—everything came to the end each had feared. The premises at Prinsengracht 263 was raided by a German security service unit, which consisted of a German security officer named Karl Silberbauer and at least three Dutch plainclothes detectives under his command. They had received a phone call that Jews were hiding in a building at that address. The raiders arrived after 10:30 a.m. with guns drawn.

In what has always struck me as curious—with implications to the possible betrayer—the warehouse doors were open, and inside was a man we shall have cause to focus on throughout our investigation: foreman Willem van Maaren. (He was a more recent employee than the others and had previously been a total stranger to the premises and annex.) Van Maaren pointed the police to the steps leading up to the offices (Sullivan 2022, 102–104).

Victor Kugler (who ran the Opekta business for Otto Frank) was confronted in his office by Silberbauer and followed the officers upstairs to the storerooms. After the bookcase was removed (more on this later), Kugler entered the secret annex first followed by the others (Perricone 2019, 46–48).

The raid team gathered the occupants together, searching them for weapons. The group then stood with their hands in the air while their belongings were roughly searched. Silberbauer dumped out Otto's briefcase and tossed other papers onto the floor, along with the diary. (This neglect allowed it to be rescued subsequently by one of the helpers, Miep Gies, who later passed it to Otto and the world.) The raiders concentrated on loot, keeping cash, jewelry, and dentist Fritz Pfeffer's dental gold.

The officials took ten prisoners—the eight annex residents plus Kugler and Kleiman as accomplices. They were loaded into a dark green truck that waited on the canal. The group spent four nights in a central city prison where they were interrogated. Then the eight Jews were sent to the Westerbork transit camp (while Kleiman and Kugler were separately transported to the Dutch labor camp located at Amersfoort). The eight were eventually sent on to the extermination camps Auschwitz and Bergen-Belsen (Sullivan 2022, 107–111).

Suspected Betrayers

The question remains: Who betrayed Anne Frank and the others? I have already hinted at my own suspect, Willem van Maaren, so let us save him for last after we have considered several others of the at least thirty individuals who have been accused. Then we will take up the new suspect, long anticipated to come from the Cold Case Team, before finally studying the evidence against van Maaren.

• *Anton "Tonny" Ahlers*. Ahlers was an anti-Semitic criminal who had blackmailed Otto Frank. Ahlers admitted to working as a courier between Dutch Nazis and the Gestapo, and he boldly asked Otto for twenty guilders; he showed him a letter from an acquaintance of Otto's to the Gestapo, claiming Otto had made anti-German statements. Otto did not see this as blackmail but rather as a helpful warning, and he gave Ahlers money on that and another occasion. In any event, the evidence against Ahlers as a betrayer is essentially only theoretical (Sullivan 2022, 182–194; Perricone 2019, 87–88).

The last known photograph of Anne taken in May 1942, taken at a passport photo shoot. (Photo collection Anne Frank House, Amsterdam. Public Domain Work.)

• *Joseph "Job" Jansen*. Another anti-Semitic suspect is the man who wrote the above-mentioned letter Tonny Ahlers shared with Otto, claiming Otto had made "statements hostile to Germany." However, there is a lack of evidence against Jansen as betrayer, other than that he was jailed for collaborating with the enemy during the war (Perricone 2019, 88; Sullivan 2022, 170–181).

• *Lena van Bladeren Hartog*. Hartog was, interestingly, the cleaning lady of the Opekta warehouse. Additionally, she was the wife of a worker there, Lammert Hartog, who served as assistant to warehouse manager Willem van Maaren. However, Lena would have made an unlikely betrayer; it would have been better for her to remain quiet because her husband was himself an illegal worker at Opekta (Sullivan 2022, 313)!

• *Nelly Voskuijl*. Another, more recently named woman suspect is Nelly Voskuijl, the younger sister of one of the trusted helpers at Opekta, Bep Voskuijl. According to a book published in 2015, Nelly was resentful of Bep for Bep's sympathy to Jews and had sought to reveal the group's whereabouts. She was arrested in October 1945 and charged with collaborating with the Nazis. Theories aside, there is a lack of convincing evidence pointing to her being the betrayer of those in the annex (Sullivan 2022, 258–273; Perricone 2019, 88–91).

• *Ans van Dijk*. Yet another woman suspect is a Jewish woman, Ans van Dijk, who was forced by the Gestapo to become a secret agent to save herself from deportation. However, although she was involved in the capture of others—for which she was executed in 1948—the Anne Frank House's own investigation discredited van Dijk's involvement in betraying those in the annex (Perricone 2019, 91).

• *Maarten Kuiper*. A Dutch police officer who may have been on the raid of the annex, Maarten Kuiper was the suspect accused by Otto Frank's biographer, Carol Ann Lee. She suggested he even made the accusatory phone call, but in fact he was never suspected officially of having been the betrayer of the Franks and the others at the annex. In any event, Kuiper was executed in 1948 for, among other things, murdering seventeen resistance fighters and Jews (Lee 2003; Perricone 2019, 91).

• *The Annex's Neighbors*. Among the many others who could have made the suspects list were those who lived in the neighborhood surrounding Opekta's premises at Prinsengracht 263. Several had their own suspicions about what actually transpired inside the building in the 1942–1944 period. Some reportedly heard such noises as a toilet flushing or people talking during the time when employees had supposedly left for the day. Some even believed it was the Frank family members themselves, which demonstrates that nearly anyone might have overheard such speculation (Perricone 2019, 91).

• *No One at All*? Was it even possible that *no one* turned in the residents of the secret annex? In 2016, the Anne Frank House in Amsterdam published a theory suggesting it was an investigation of a ration-card fraud, rather than an informant's tip, that led to exposure of the annex (Perricone 2019, 87). However, the idea that the arresting team officers did not know they would discover Jews in hiding when they entered the warehouse goes against more—and better—evidence, as we shall see.

A Very Cold Case

First in 1948 and again in 1963, Dutch police carried out investigations that attempted to discover the identity of the person who betrayed Anne Frank and her seven fellow Jews in hiding. Both these inquiries focused mainly on one person: Opekta foreman Willem van Maaren. Unfortunately, when the van Maaren file was finally closed on November 6, 1964, the prosecutor stated that, as had happened with the 1948 investigation, the second inquiry "did not lead to any concrete results" (Sullivan 2022, 311).

Then, in January 2022, the results of a much-vaunted Cold Case Team were published, chronicled in Rosemary Sullivan's detailed book *The Betrayal of Anne Frank: A Cold Case Investigation*. This team—consisting of detectives, historians, and other experts (some thirty-one in all, as well as numerous additional consultants)—was billed as having decisively solved the mystery after a six-year study.

In reaching their decision, the team studied tens of thousands of pages of documents and interviewed numerous people, especially descendants of persons who were familiar

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with the Franks. They employed the methods of detectives, profilers, forensic scientists, data analysts, and others. They boasted such techniques as the use of computer algorithms (in searching for connections between numerous people) and even artificial intelligence ("Anne Frank" 2022; Perricone 2021, 83; Sullivan 2022, 21–34).

Headed by ex-FBI agent Vincent Pankoke, the team offered their own suspect—one in fact previously named. He was Arnold van den Bergh, who had served, ironically, as a member of Amsterdam's Jewish Council. The team postulated that he had given up the Franks and the others to save his own family.

At the center of the accusation against van den Bergh as a suspected informant was an unsigned note. It had been received by Otto Frank after the liberation, and Otto had typed his copy of the note as follows:

> Your hideout in Amsterdam was reported at the time to the Judische Auswanderung [Jewish Emigration] in Amsterdam, Euterpestraat by A. van den Bergh, a resident of the time at Vondelpark, O Nassaulaan. At the J.A. was a whole list of addresses he submitted. (Sullivan 2022, 342)

But while the Cold Case Team enthused that the note was hard evidence originating with Otto Frank, it was less than it seemed.

The note was not only *anonymous* but was only a *copy* Otto had made of the original. It was really little more than just another accusation, raising more questions than it answered, and it could be seen as something that Otto Frank had simply

passed on to the detective, Arend Jacobus van Helden, who conducted the second investigation into the raid on the annex (Sullivan 2022, 308–379).

In fact, since publication of the team's findings, several scholars of World War II and the Holocaust have come forward to express doubts about both the methods and conclusion of the Cold Case Team's investigation. The scholars called the evidence "far too thin." In reply, one of the investigators, Pieter van Twisk, acknowledged that the team had not claimed they had discovered the complete answer to the betrayal mystery ("Anne Frank" 2022).

Suspect Redux

Meanwhile, it is my view that we should return to the man who has been repeatedly considered the major suspect—a nefarious person first mentioned in Anne Frank's diary. I have been retrospectively "shadowing" him (as we used to say at Pinkerton's), which I think the reader will find instructive. (As I have done in other cases for half a century, I will emphasize the principle of Occam's razor that the simplest tenable explanation—that is, the one with the fewest assumptions—is most likely to be correct. I will also continuously make use of corroborative evidence.)

Willem van Maaren—the only individual officially suspected as the betrayer—came on the scene in June 1943. Before that, Johan Voskuijl, Bep's father, handled a variety of jobs at the warehouse, including disposing of waste from the secret annex and constructing the hinged bookcase; he left after developing cancer.

Van Maaren was sent by the public employment office in response to a request by office manager Kleiman. This proved extremely risky, and soon Kleiman would come to regret his action. Van Maaren turned out to be a highly suspicious character; he was incessantly inquisitive. Early on, he asked workers about people being in the stockroom after closing time. For instance, he once found a wallet lying on a table. It actually was left by one of the eight hiders, Hermann van Pels, who often made such nighttime visits into the warehouse. However, when van Maaren inquired of this to Kugler, the Opekta manager, he claimed the wallet as his to cover up the problem (Sullivan 2022, 97, 251).

Anne Frank was keeping track of van Maaren in her diary. Noting early on that he was "getting suspicious about the Annex," she mentioned some of the excuses the helpers used to conceal the fact they were really tending to the residents:

> A person with any brains must have noticed by now that Miep sometimes says she's going to the lab, Bep to the file room and Mr. Kleiman to the Opekta supplies, while Mr. Kugler claims the Annex doesn't belong to this building at all, but to the one next door.
>
> We wouldn't care what Mr. van Maaren thought of the situation except that he's known to be unreliable and to possess a high degree of curiosity. He's not one who can be put off with a flimsy excuse. (Entry of September 16, 1943 [Frank 1991, 146])

Regarding his curiosity, van Maaren would share certain suspicions with his assistant, Lammert Hartog. He explained to Hartog that he had been noticing exceptionally large quantities of both milk and bread being delivered to the premises. He dispensed such pointed observations frequently. As a result, Frank noted in her diary that whenever van Maaren left for lunch, "The whole gang breathes a sigh of relief" (entry of August 5, 1943 [Frank 1991, 132]).

Van Maaren not only knew about the annex—he had seen it when he had been sent to fix a leaking roof—but he soon came to suspect people were living there. Among his tricks were balancing pencils on the edges of desks to detect nighttime passersby and scattering flour onto the floor to record footprints—thus to reveal that there were people hiding in the building who might come out after it was closed for the day. Very damning in this regard was the testimony of his assistant, Hartog, at the first investigation of van Maaren in 1948. Hartog swore that van Maaren told him there were Jews in hiding at the site and that was *just fourteen days before the police raid* (Sullivan 2022, 251, 252, 254)!

Not only was van Maaren incessantly inquisitive, but the helpers came to believe he also stole warehouse goods and sold them on the black market. He would eventually confess as much: under interrogation during the 1948 investigation, he admitted to having stolen from Opekta. Another warehouse assistant of van Maaren, Johannes de Kok, admitted to a detective during the second investigation that he had helped van Maaren fence the stolen Opekta company goods (Sullivan 2022, 97, 254, 310).

There had been at least three break-ins at the warehouse between 1943 and 1944. On the night of March 1, 1944, Frank recorded that a burglar had been spooked by Mr. van

Pel's shouting and fled, leaving the warehouse door open. "Since there were no signs of a forced entry," she writes, "the burglar must have had a duplicate key." She asks: "Was it one of our own warehouse employees?" She further wonders now that he had heard one of the secret residents and perhaps had even seen him, "will he turn us in?" (Frank 1991, 216).

I believe the obvious suspect here is Willem van Maaren, whom Frank had much earlier referred to as "the man with the shady past" (entry of August 5, 1943 [Frank 1991, 132]). Van Maaren's past was one of failed businesses, long periods of unemployment, and various petty-theft charges—underscoring his later admission to having indeed stolen from the Opekta warehouse (Sullivan 2022, 310). Perhaps I can be pardoned for noting the irony of Frank's postscript to the burglary entry: "P.S. We'd be delighted if you could hunt up a good detective for us" (Frank 1991, 217).

Raid Issues

Continuing to shadow Willem van Maaren, let us move on now to the day of the police raid. That morning a German officer, Karl Josef Silberbauer, a sergeant in what was typically called a "Jew-hunting unit" received a phone call from his superior officer, Lieutenant Julius Dettmann. Dettmann stated he had just himself received a call alleging that Jews were hiding in a warehouse complex at an address in central Amsterdam. (It is well to note that, according to a caution by Rosemary Sullivan [2022, 4], "There are many variations in the accounts of what happened before and after Silberbauer and his men arrived at Prinsengracht 263.")

Silberbauer would later state (in a 1963 newspaper interview) that it was one of the employees of that warehouse who made the call to Lt. Dettmann. While he later somewhat walked back that statement, saying he was never actually made aware of who that individual had been, he still left open the possibility that it had indeed been a warehouse employee (Sullivan 2022, 298–299).

At the time Silberbauer and three or more Dutch policemen arrived at Prinsengracht 263, the warehouse doors were reportedly "wide open," and "standing inside" was Willem van Maaren with his assistant. When asked, van Maaren pointed the way to the upstairs offices (Sullivan 2022, 104; Perricone 2019, 85–86).

Those who posit a different betrayer claim van Maaren could not have made the call to Lt. Dettmann because no phone was available to him. But while public telephone kiosks had been eliminated by the Germans and the front office where the only phone was available had supposedly been occupied all morning (Sullivan 2022, 299–300), in fact van Maaren could simply have used the phone in any of the neighboring stores. (He not only knew such businessmen but had spoken with them about their observations of strange goings-on at the Opekta building. For example, a seller of herbs at Prinsengracht 269 once asked van Maaren, "What have you got hidden there?" [Sullivan 2022, 311].)

Another real possibility is that the tip passed by Dettmann to Silberbauer did not actually come through a phone call "as had always been *assumed*" (emphasis added). That means, for instance, that the tip could have been passed by an informant and received in any way—as by phone, in person, or by an intermediary, for example—and was not even necessarily received the very morning of the raid (Sullivan 2022, 280–281). Thus, the tip could well have been made by our suspect Willem van Maaren, as I believe it was.

Van Maaren seems to have lied his way through the two police investigations into the raid of the annex (that of 1947–1948 and again in 1963–1964). For example, in the first investigation when he was revealed as a thief, van Maaren sought to incriminate his accusers. He stated shamefully that after the raid the helpers Bep and Miep had gone to the annex and grabbed things to "keep for themselves." In fact, it was they who rescued Anne Frank's diary and accompanying papers, which Miep later turned over to Otto, saving them for posterity (Sullivan 2022, 254; "Anne Frank" 2022; Perricone 2019, 52).

Of considerable significance is how the police raid team encountered the bookcase. Did they have *prior information* to this clever covering of the entrance to the secret annex? The Cold Case Team, arguing against van Maaren as betrayer, suggests that Opekta boss Kugler was simply forced to lead the officers there—that is, up a semi-spiral staircase to the upstairs landing where the bookcase stood. However, this does not appear to be what actually happened.

Instead, officer Silberbauer seems to have stopped in Kugler's office while the other raiders continued their search. Then Silberbauer and Kugler followed up the stairway. They stopped on the landing with the bookcase. There "the three Dutch policemen *were already busy trying to open the bookcase*" (emphasis added; Perricone 2019, 48). Kugler (1958) went on to describe the raiders tugging at it until it finally tore loose from its attachment. Then he was forced at gunpoint to enter the secret annex first (Perricone 2019, 48). This scenario suggests the raid team already knew of the bookcase, which would indicate an inside betrayer—probably van Maaren.

The evidence showed van Maaren tried to make himself look less guilty. He claimed that he would not have done anything to bring attention to himself—such as telling the Gestapo about Jews in hiding at his workplace. He said that was because his eldest son, Martinus, was wanted for avoiding *Arbeitseinsatz* (forced labor). (Workers in occupied territories had to replace the work of German men serving as soldiers.) While no record was found of van Maaren's son having been on such a wanted list, if the son *was* wanted, then van Maaren's informing on Jews could have been used in exchange for the son's safety (Sullivan 2022, 312).

Opportunistic Informant

Denial was van Maaren's strategy throughout. Fifteen years later at the second investigation, he repeated the act, aided by witnesses' fading memories. He never really offered an explanation for his relentless obsession with the evidence of Jews in hiding. He did not appear to be pro-Nazi, but he showed zero empathy for Jews' plight—let alone for those suffering geno-

cide. People who knew him found him "financially untrustworthy" (Sullivan 2022, 310–312), and we have seen that he stole from his own employers. In brief, he seemed to lack a moral compass and was directed by selfishness.

As we continue watching him from the shadows, we note that "Van Maaren once asked Kleiman whether a Mr. Frank had worked in the building, implying that he was conducting his own investigation" (Sullivan 2022, 252). Here may well be his motive: van Maaren may have thought, selfishly, that he could use the evidence that had come his way to get some benefit from the Germans.

My experience as a Pinkerton working as an undercover agent, sometimes surveillant, and occasional police informant has given me some insights into van Maaren's actions. He obviously was not a trained agent, and the happenstance of his getting a job that just became available argues against him being assigned as one. So does the length of time he remained there. His amateurish snooping called attention to him, and his gratuitous sharing of information alerted those who were hiding.

Instead, I think it likely that he may have acted as an opportunistic informant. That would have suited his personality as we know it. All in all, there is much corroborative evidence indicating he is our man. If so, we may well ask: Could not security Lt. Julius Dettmann—who ordered the raid—have come forward at the first inquiry to identify him (if van Maaren had not really been anonymous)? He could not. He had meanwhile hanged himself in his own jail cell (Sullivan 2022, 249). Anne Frank was cheated yet again. ■

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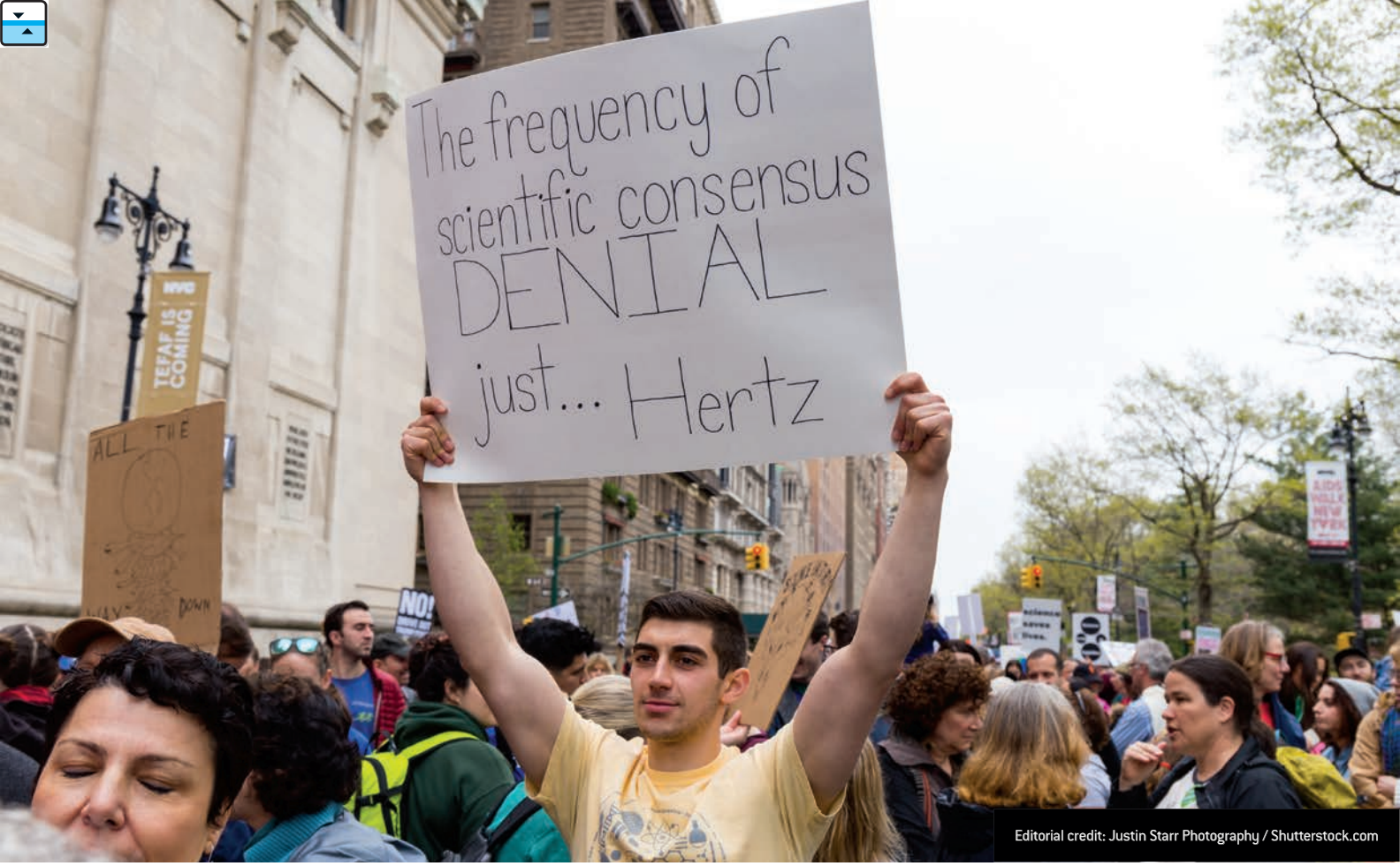
The Secret Keep

(for Anne Frank and the Others)

JOE NICKELL

They disappear,
nowhere
        a trace,
        a bookcase
biding
their hiding
        place.
At a noise,
        fear
                takes
their eyes.
                They forsake
        real air,
                the break
of sunrise.
        Betrayal
                stalks
        their unreal
keep,
        until
                they almost wake
        for death's final
sleep.



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How to Talk to a Science Denier

LEE MCINTYRE

The best way to defend science from science deniers is by giving scientists and science communicators some better tools to push back. Of course, what could be a better tool than scientific *evidence*? But here's the problem: You don't convince someone who doesn't hold their beliefs based on evidence by giving them more evidence. This is called the "information deficit model," and it doesn't always work. So, we need a more strategic approach.

Let's start with what the *research* tells us.

Some people are quite worried about something called the "backfire effect." This was due to a 2010 paper by Brendan Nyhan and Jason Reifler that purports to show that by presenting someone with contravening evidence you can sometimes make things *worse* and cause them to double down on their mistaken beliefs (Nyhan and Reifler 2010). It's a perverse effect; by trying to refute someone, we might actually be making them more committed to their mistaken beliefs, which raises the question: Are we doing more harm than good by arguing with those who disagree with us?

But recent studies by Ethan Porter and Thomas Wood in 2017 (Wood and Porter 2017), and many others since, have shown that the backfire effect finding couldn't be replicated—which is great news because it means that you can't hurt anything by trying to convince someone to give up their denialist beliefs. You may not succeed, but the worst that can happen is that they stay dug in. Your intervention isn't going to make their beliefs worse. In fact, in that case, the *worst* outcome would be if you don't try to change their minds at all and just walk away.

A 2019 study by Philipp Schmid and Cornelia Betsch provided the first empirical evidence that we *can* fight back effectively against science deniers, and they showed us how (Schmid and Betsch 2019). The study was done online with 1,770 subjects in the United States and Germany who were first exposed to incorrect scientific information and then immediately corrected. This is a form of debunking, and they found that in a statistically significant number of cases, it worked in getting deniers to give up their false beliefs. But there are two ways of doing it.

The first way is perhaps no surprise. It's called "content

rebuttal," in which a content expert works in their area of expertise. If you're a climatologist and the subject at issue is climate change, go right ahead and rebut them on the facts. You won't necessarily convince all of them, but this approach will work in a statistically significant number of cases.

But now how about the rest of us who aren't scientists? Here's where the Schmid and Betsch (2019) study really helps. There is a second strategy that doesn't have anything to do with the *content* of the denier's beliefs but with the flawed reasoning scheme behind it. This is called "technique rebuttal," and it's based on an original insight by Mark and Chris Hoofnagle (Hoofnagle and Hoofnagle 2007), later developed by cognitive scientists John Cook and Stephan Lewandowsky (Cook 2020), which shows that all science deniers follow the same flawed blueprint:

1. Cherry-picking evidence;
2. Belief in conspiracy theories;
3. Reliance on fake experts (and the discrediting of real experts);
4. Illogical reasoning;
5. The insistence that science must be perfect to be credible.

What Schmid and Betsch (2019) showed is that if you learn these five tropes of science denial, you can use them to undercut denialists' beliefs. There are some examples in their paper, along with a few scripts for what to say, and I encourage you to take a look. But here's the knockout punch: Schmid and Betsch found that both content rebuttal and technique rebuttal work *equally well* and that there is no *additive* effect. This is more good news because it means that even laypeople can do it. You don't need to be a scientist to defend science.

But there is some bad news. The study showed that we can only mitigate, not overturn, the effects of exposure to scientific misinformation. Once a population hears a falsehood, there are some of them who will just believe it even after it's been debunked. No matter how good you are at debunking, at the group level there is always going to be some lingering negative effect of exposure to scientific misinformation—which means that the best thing is not to allow the deniers to spread their misinformation in the first place. But the worst thing to do is to walk away. Schmid and Betsch joke that if you're invited to a debate, you should say yes but then cancel at the last minute if it means that the event will be canceled completely. But if it's going to be held without you anyway, then you've got to show up. Why? Because you want to keep the audience from hearing that misinformation!

Now, of course, as an academic investigation, the Schmid and Betsch study had some limitations. These weren't mistakes, fraud, or negative findings, but no one study can cover everything that's relevant to the question at hand. The first limitation was one of *time proximity*. This study only dealt with debunking science denial messages immediately after they were heard for the first time by naive subjects. But what about the problem of *overturning* the beliefs of hardcore deniers whose convictions have been nearly set in stone because they've been marinating in scientific misinformation for years? Could content rebuttal or technique rebuttal work on them, too? We don't know because this question wasn't studied.

One intriguing query along these lines showed up in a commentary on the study by Sander van der Linden, who brought up the issue of "prebunking" (van der Linden 2019). For example, what if you used technique rebuttal but instead of waiting until someone had already heard false information, you tried to intervene beforehand? Maybe you'd say, "You're going to hear a conspiracy theory about vaccines, but here's why that's dangerous." Would that work better than debunking? Could we defang the snake?

I love this idea, and there's good empirical work that shows that it can be effective. But even if it works, it doesn't answer the question of whether it's possible to overturn the beliefs of hardcore denialists—for whom it's *way* too late to prebunk their mistaken beliefs. So, my question still stands: Can a hardcore science denier's beliefs be debunked with either content rebuttal or technique rebuttal?

A second limitation is that the study was done only online. Today, most studies are done online, and I understand why. But what about real life? Often we encounter a science denier *in person*—across the Thanksgiving table, for example—or at least in some interactive forum. So, another concern here is whether these methods of debunking will work at all—or perhaps work even better—face to face. But again, this wasn't studied. So how do we know?

I think there are answers to these questions. Here, however, we begin to outrun the scientific literature. So I'm going to report on what I've learned from the anecdotal evidence and from my own practical experience, as reported in my book *How to Talk to a Science Denier* (MIT Press, 2021).

There are many examples in the news media of hardcore science deniers who have changed their minds. But how does this happen? At home, I have a thick file of these stories in a folder on my desk, and after looking carefully at each one, I've discovered a pattern. Virtually every hardcore denier who has had their mind changed on a scientific subject has done so after a face-to-face encounter, when evidence was presented by someone they trusted. Personal engagement seems to be key, and I believe that is because science deniers don't just have an "information deficit" but a "trust deficit." It matters crucially *who* is sharing the information with them—and how. You convince someone best when they trust you—and you build trust best in an in-person encounter.

Two quick stories:

In 2014, there was a measles outbreak in Clark County, Washington, right across the Columbia River from Portland, Oregon, my hometown. There was a pretty heavy anti-vaxx community there at the time, which may explain why that was where they had a measles outbreak. In response, Governor Jay Inslee—no science denier—sent public health officials down to Clark County to talk with the deniers face to face. And it worked. They didn't convince everyone, but they convinced a lot of them. In a *Washington Post* story, "It Will Take Off Like Wildfire" (Sun and O'Hagan 2019), you can read the comments of some anti-vaxxers, one of whom changed her mind after a public health official took two hours to explain

cell interaction to her using a whiteboard. At the end, she said that she felt respected and that he was very "factual" while also commenting that he seemed very "warm."

That's nice. But *two hours*? Is this solution scalable? I'll say a bit more about that later, but for now, it is important to note that if we approach people in the right way, it's possible to change their minds.

A second story—my favorite—is about Jim Bridenstine, a former rock-ribbed conservative member of Congress, who gave a speech a few years back on the floor of the U.S. House in which he repeated everything climate deniers usually say on the subject. Then Donald Trump appointed him head of NASA, because what else are you going to do with a guy like that but make him head of perhaps the leading scientific organization in the world studying global warming!

A funny thing happened to Jim Bridenstine at NASA: within a few weeks he changed his mind. Furthermore, he gave another speech admitting he'd been wrong. Climate change was real, and we were the cause of it.

When asked why he'd changed his mind, he said that he'd "read a lot" (Berke 2018), but I have another theory: he finally met all those scientists he'd been demonizing and distrusting and found them pretty reliable after all. Suddenly, he was their boss. He was hanging out with them in the halls and having lunch with them. He knew their first names.

As with the earlier example, I think face-to-face encounters built the trust that allowed his beliefs to change. What this shows is that even empirical beliefs can be tribal. We already know from the work of Jonathan Haidt, Dan Kahan, and others that belief is often shaped by issues of trust, identity, and values. Which community are you in? Does it include any scientists? If not, where are you getting your information from? As it turns out, when you are dealing with hardcore deniers, context matters. *A lot.* It's not that evidence can't be persuasive; it's that you have to approach someone with evidence in the right way after building trust (Shermer 2017).

Don't insult them or yell at them. Treat them with respect and stay calm. The most important point is to *listen*. Make sure they feel heard. Be patient. Even if you can't talk someone out of their beliefs, sometimes you can create a situation where they can talk *themselves* out of it. You *can* change minds if you take the other person seriously and engage with them and then begin to have a dialogue.

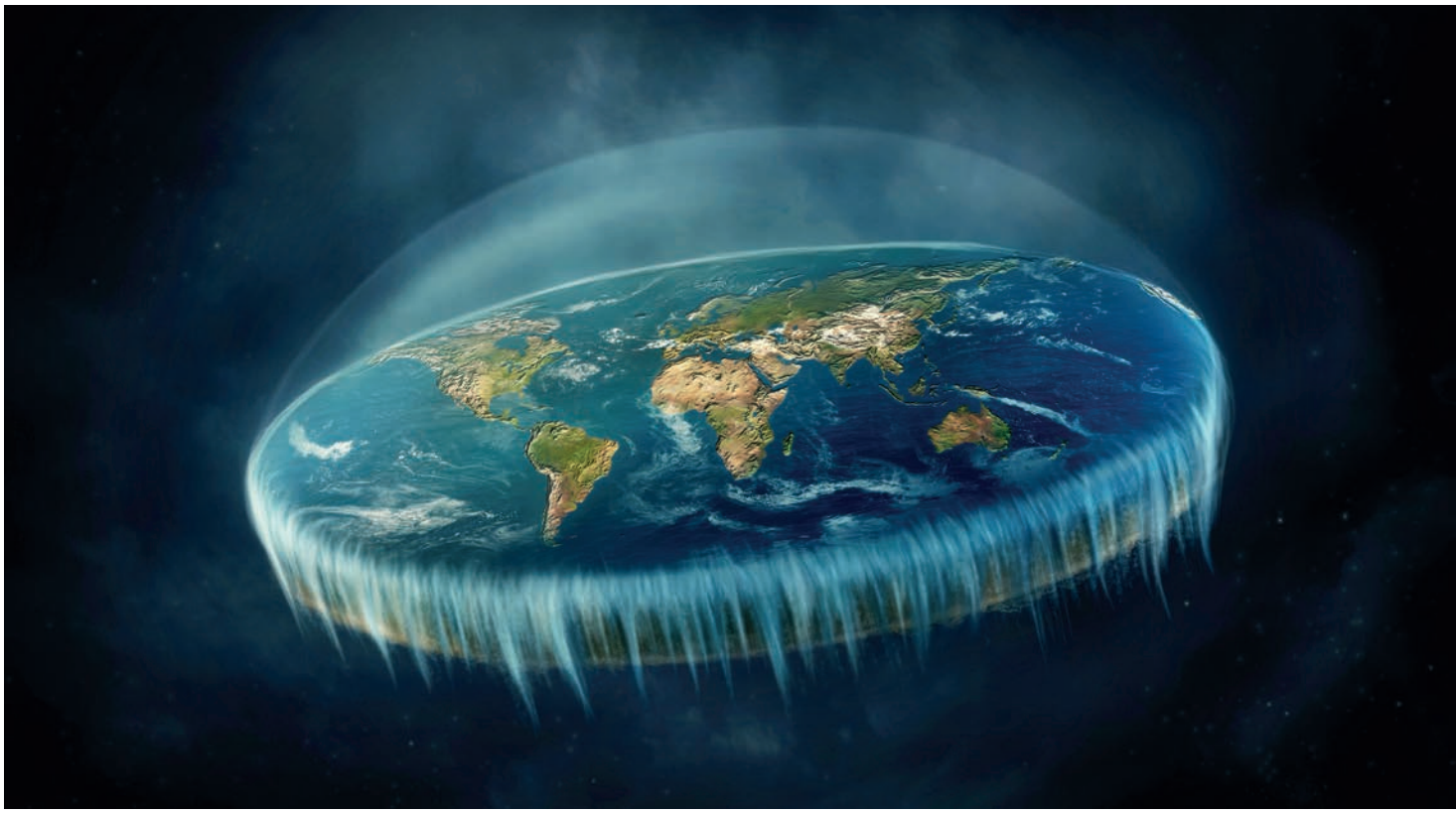
In November 2018, I went to a flat earth convention (McIntyre 2019a). I'll say that again. In November 2018, I flew out to Denver, Colorado, where I spent forty-eight hours at the Flat Earth International Conference with 650 people who believed that the earth is flat, that Antarctica isn't a continent but an ice wall spread out along the perimeter of the earth (to keep the water from falling off), that the Sun, Moon, and stars are very close to us—just outside a dome that covers the earth—and that we've never been to the Moon because no rocket ship could get through the dome.

I spent the first day with my mouth shut. Actually, my jaw dropped a couple of times, but I didn't say much. I just listened. But then on the second day, I came out as a philosopher of science who had a few questions.

I caught a break here, because to a person, all the flat earthers I spoke with said that their views were not based on faith but evidence. I knew that didn't mean I should just launch in and try to present them with scientific evidence. First, I wasn't a scientist. Second, if they hadn't believed the evidence that had been around for the last 2,300 years, why would they suddenly believe it from me? They were, by definition, conspiracy theorists. They already knew all the standard evidence for a round earth, but they didn't trust the scientists who were sharing it. They thought that all the evidence was flawed or corrupt. So instead of talking about the evidence, I sought to challenge their reasoning. As a philosopher, I wanted to talk about how they were *thinking* about the role of evidence.

My key question here was one that I cadged from Karl Popper: "What evidence—if I had it in my back pocket—would convince you to change your mind?" They had no answer to this, and that was significant. It made them think for a moment, and I was happy to shut my mouth again and let them sit with that discomfort. They had said that their beliefs were based on evidence, but were they? I was out there trying "technique rebuttal" before the Schmid and Betsch study had even come out! (Maybe that's why I liked the study so much. Maybe confirmation bias works for philosophers, too.)

My working theory was that flat earth—and indeed all science denial—wasn't based on evidence at all but on identity and ideology. If so, this meant that, no matter what the topic, all denialist reasoning was the same. So if I learned how to talk to a flat earther, I could use what I learned to talk to a climate denier or an anti-vaxxer as well. To me, flat earth was



a great chance to witness science denial in its most elemental form.

Of course, I was also concerned with the fact that flat earthers use these conventions to recruit new members. When I was speaking to someone, we usually had an audience, and I didn't want to let any nonsense go unchallenged. Even if I didn't convince my conversation partner, maybe someone else would overhear me pushing back. But I also wanted to take a shot at reaching the hardest of the hardcore, so I liked to grab the speakers just after they came off stage.

My best conversation was with a guy who had just given a talk about how to recruit people *into* flat earth! I waited for the crowd to thin a bit, then invited him to dinner (my treat), where we talked for two hours, completely alone. He was a very intelligent guy. He understood my gambit immediately and *wanted* to say what would convince him, but every time he mentioned something—going up in a rocket, flying over Antarctica—he immediately took it back. He kept finding one conspiracy theory after another to doubt the evidence we gathered would be accurate. By the end, he was frustrated and so was I.

So, did it work? Well, neither he nor anyone else tore off their lanyard and left the convention saying, "What a fool I've been!" But maybe that's not really surprising. They had 649 other people there to reinforce their views. By the time someone comes to a flat earth convention, the social pressure to believe must be enormous. And remember that most of my conversations were one-offs with a stranger. If I'd been smart, I would have followed up and built relationships with people over time. Especially the guy I took to dinner. And yet, I hope that I made a difference. At least I showed up! By listening I got some folks to listen back, and in the process, I think I built some trust, which is the first step to changing belief.

The flat earthers made a big deal of the fact that no physicists had come to their conference to refute them. If it was so easy to do, why weren't they there to do it? They said it was because they were scared. Of course, that's absurd, but if scientists either don't show up or just present their evidence and walk away when their integrity is questioned, we all lose. If, as Schmid and Betsch (2019) have shown, content rebuttal works, shouldn't more scientists be out there giving this a try rather than saying, "It's no use arguing with these people?" After all, are *scientists* going to be denialists? If there is now empirical evidence to show that this method *works* to push back against science deniers, are we going to ignore it (McIntyre 2019b)? And what about the rest of us? We don't have to sacrifice time away from the lab. Why not learn the five tropes of science denial and try some technique rebuttal? It is worth arguing with these people, because if you don't, then only liars will have the microphone, and their beliefs will never change.

It used to be that science deniers existed but maybe you'd never met one. The guy in the tin foil hat on the corner handing out mimeographed sheets about how we'd never been to the Moon was dismissed as a lone crank. But suddenly denialist beliefs are everywhere. Why?

The answer is that science denial is now organized. The internet allows someone to create a campaign of doubt about anything they would like and recruit thousands if not millions of others to join them. Why would they do that? Because it serves their interests. Denialist beliefs don't come out of

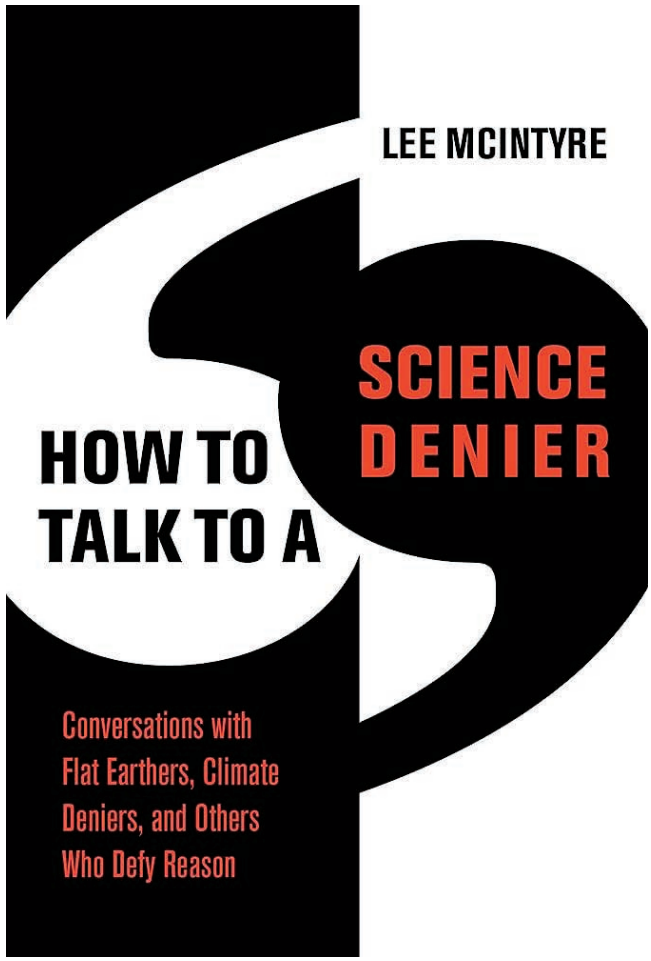
nowhere. Most science denial is based not on *mis*information but *dis*information**.** *It's not a mistake; it's a lie.* Science denial is largely the result of an intentional campaign of propaganda that is designed to get people to believe false things about science based on the propagandist's selfish interests. Naomi Oreskes and Erik Conway spelled this out in their brilliant 2010 book *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*.

But it's not always about money. As we saw during the pandemic, today science denial is often about political ideology. But the point is the same. Whether the motivation behind the disinformation is economic, political, or ideological, the deniers are out there doing someone else's bidding, and most of them don't even realize it. People don't suddenly wake up one day and wonder whether there's a Jewish space laser or whether there are microchips in their vaccines. They're fed that as *dis*information, from someone who is benefitting from the falsehood. In the case of microchips, there's a heartbreaking and infuriating story behind this.

In April 2020, an article appeared in a publication titled the *Oriental Review*, which said that any future vaccines developed in the West would have tracking microchips in them, courtesy of Bill Gates, who held patent number 666 on the technology. At the end of the article, it said "share on Facebook" and "share on Twitter," which many people did. By May 2020, fully 28 percent of the American population believed this absurdity. Now think about that for a moment: just one month after the story appeared—and still four or five *months* before Pfizer or Moderna had even developed their vaccines—millions of Americans were already convinced they would be dangerous. Why? Well, what the article did *not* say was that the *Oriental Review* is one of four English-language propaganda arms of the SVR, which is the branch of the Russian intelligence service that deals with foreign disinformation.

Furthermore, I didn't have to break into CIA headquarters to find this out. It was in the *Wall Street Journal* (Gordon and Volz 2021). But it was a one-day story behind a paywall, and few other media outlets picked it up or bothered to try to debunk it. How many of the one million Americans who died of COVID-19 were scared to get their vaccine because of this horrible disinformation and the ridiculous amplification it received on partisan and social media (Tayag 2022)? We'll never know. But if anything could give you empathy for a science denier—and encourage you to try to talk to them—maybe it's this. Realize that most science deniers are victims. Realize also that a secondary purpose of disinformation is to get the believers not to trust the truth tellers. This is another reason it's so important to engage with them—to break down that wall of distrust.

As I see it, the real problem with science denial is three pronged. We have to think about who is creating the disinformation, who is amplifying it, and how to deal with the people who are victimized by it. In my book *How to Talk to a Science Denier* (2021), I address the third problem, but there's still plenty of work to be done on the other two. How can we stop the creation of disinformation? Maybe we can't. How can we keep it from being amplified on social media? Actually, this problem might not be as hard to solve as we think. A while back, the Center for Countering Digital Hate found that 65 percent of the anti-vaxx propaganda on Twitter was created by just twelve people (Bond 2021). When liars have a microphone, they can do incalculable damage. So let's think more about what we might do to change that.


LEE MCINTYRE
HOW TO TALK TO A
SCIENCE DENIER
Conversations with Flat Earthers, Climate Deniers, and Others Who Defy Reason

I recently heard Stephan Lewandowsky make a proposal that made a lot of sense (Lewandowsky 2021). The mis- and disinformation problem at social media companies may not require government regulation of content so much as a demand for transparency. At the moment, the algorithms at Facebook and Twitter are black boxes. Who knows what dangers lurk in the way they are tweaked to goose engagement at the cost of truthfulness? If there were some way for academics or other outside researchers to have a look at what the social media companies are doing—while shielding user data from public view—maybe we could head off any widespread harm before it's too late instead of waiting for a whistleblower.

But there are other things I think we can do as well.

One goal of the Committee for Skeptical Inquiry (CSI) is to debunk and expose people who make outrageous nonevidential claims. And that is a tremendous public service. But is it enough? Do we just want to "be right" or do we want to keep more people from getting duped in the first place? Most

of the charlatans surely know they are cheating. Their minds can't be changed because they don't really believe in telepathy, dowsing, or astrology in the first place. They're just making a buck or seeking fame, which is why it's so delicious to expose them. But what about the people who believe them? Yes, we might reach them by poking a hole in the claims of the people who have been lying to them. But as we've seen, some are so far down the rabbit hole that merely providing them with the evidence may not be sufficient to change their minds or to keep them from falling for another scam the next time.

Fifty years ago, most people trusted scientists even if they didn't always understand how science worked. Today trust in science seems to have become a more partisan issue, with scientists' integrity sometimes openly questioned (Burakoff 2023). Why is that? I think in part it's because scientists and science communicators haven't done enough to fight back against the disinformers' twin goals, which are not just to raise doubt about some particular scientific theory but—by demonizing scientists—to undermine the very process by which those theories are built. I'd like to see a public education campaign built around the idea that the special epistemic status of science is due not to the authority of *scientists* but the authority of *evidence*.

To make a scientific claim is to be willing to change one's mind on the basis of new evidence. This is why the work of CSI is so important. We take the liars seriously. We actually listen to their evidence. And when it doesn't measure up, we say so. In public. But another part of our job, I think, should be to do more public outreach about how science works. Not just about the results of science but about what I've called the *scientific attitude*. The idea that science is based not on proof or certainty but warrant. That what it means to be a scientist is to be willing to admit in advance that one's theory *could* be overturned if the evidence were sufficient and to specify what that evidence would be.

That is the real difference between scientists and deniers. For all their skepticism, scientists are wonderfully open minded. As Carl Sagan once said, science is a balance between these two goals (Moschel 2015). We must be neither gullible nor intransigent. What makes a denier a denier isn't simply their disbelief in the scientific consensus or their lack of accurate empirical information or even their poor reasoning ability. It's their attitude. Their stubborn conviction that no new evidence can change their minds because the only people they trust have already told them that they are right. ■

Note

This article was adapted from a presentation at CSICon on October 21, 2023, in Las Vegas, Nevada.

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Holy Honey: Bad Research and the Dangerous Promotion of Honey for Diabetics

OMAR MERIWANI

Does anyone think that honey is good for diabetes or that it has a hypoglycemic effect? Believe it or not, some "studies" suggest just that. Some are more careful in describing the effects of honey on diabetes, but they're still contradictory and misleading. Most research publications about honey and diabetes have sensational titles, though their abstracts are more sober. The findings typically show weak effects or no positive effect of honey on either type of diabetes. Sometimes the study is just dangerously illogical. Common sense and basic knowledge tell us that honey is a sugary substance that can only raise blood sugar levels for diabetics and non-diabetics alike—so what explains all this "research"?

An article in the UK *Daily Express* online edition describing the new findings of a University of Toronto study (Ahmed et al. 2022) carried the headline: "Honey Shown to Reduce High Cholesterol and Blood Sugar Levels in New 'Surprising' Study" (Buntajova 2022). The article's author somehow missed the statement of Tauseef Khan—a senior researcher who worked on the meta-analysis: "We're not saying you should start having honey if you currently avoid sugar" (Oldfield 2022). But the *Daily Express*, like many other news sources, never clarified that the study is not advising diabetics to start consuming honey. Similarly, WebMD seemed not to consider the effect of the title of their article, "Eating Honey May Help People Manage Cholesterol and Blood Sugar," based on the same study. However, it did mention Khan's caution at the end of the article (O'Mary 2022).

Given that many people will not read the article—or at least will not read all the way to the last sentence—journalists should be aware that misinformation can spread like fire. One study found that about 60 percent of people may share a news piece without even clicking on it (Gabielkov et al.

2016), which agrees with another study that found a similar percentage of Americans are only interested in headlines (Cillizza 2014). Compounding the issue, other misleading modifications can happen when the article is translated into other languages.

And what did the University of Toronto website say about how such news would be perceived (Oldfield 2022)? Are phrases such as "blood sugar" or "fasting blood glucose" often used in any context other than diabetes? Nothing in the article says clearly that this is not for diabetics except the statement: "We're not saying you should start having honey if you currently avoid sugar." Will that vague statement on an important health issue be understood as "not for diabetics"?

Honey is more than 80 percent sugar. Studies cited by mainstream health information websites such as Healthline (Schaeffer 2017) don't make any distinction between the effects of honey and sugar with respect to blood glucose levels and point out that honey could be worse than sucrose in some cases—despite the fact that the Toronto study and Noori Al-Waili's 2004 study make it sound like honey is a miraculous thing.

We didn't need to dive too deep into the University of Toronto study about honey—a meta-analysis that had covered eighteen controlled trials—to see that the relationship between honey and blood glucose isn't as stated in the article on the university website. The data analysis section clearly states that the reduction of fasting blood glucose was of a category deemed *low certainty of evidence*, and this low certainty also applied to their findings about cholesterol, LDL, fasting triglycerides, and alanine aminotransferase. The researchers were only highly certain about a slight increase in HDL (0.07 mmol/L). Based on low-certainty facts like these, how confident can someone be about recommending a form of sugary food that is usually related to diabetes? Furthermore, the study mentions a publication bias in fasting blood glucose evidence; the researchers state: "The reduction in fasting glucose was rated as low, owing to downgrades for serious inconsistency and the presence of publication bias" (Ahmed et al. 2022). But that didn't prevent the researchers from declaring that "The results showed that oral honey intake at a median dose of 40g over a median period of 8 weeks resulted in beneficial reductions in fasting glucose" in the discussion or in the conclusion that goes further to recommend specific honey types based on the same results: "Honey, especially Robinia, clover, and unprocessed raw honey, may improve glycemic control."

Clearly, then, the problem here is not only with mainstream health information websites. A similar issue in describing the study findings appeared in another study about honey that was cited by Healthline. Al-Waili's (2004) study title declares that "Natural Honey Lowers Plasma Glucose," although the summary of results shows only that the plasma glucose "was lower after honey than it was after sucrose at 60, 120, and 180 minutes," which is not surprising given that honey's glycemic index is slightly lower than sucrose, and both sucrose and honey aren't comparable to dextrose's glycemic index, which is higher. However, the title is completely misleading and contradicts the study's findings even though the title was followed by "Comparison with Sucrose and Dextrose," because none of these substances "lowers" plasma glucose. Al-Waili has a handful of other studies about honey, all exceeding 200 citations each. He works in wound care and hyperbaric medicine, and he holds a PhD in nephrology and urological diseases.

Otilia Bobiş, who's interested in research about bee products, goes even further to talk about the "hypoglycemic effect of honey" in her review (Bobiş et al. 2018). Her statement was based on another review (Erejuwa et al. 2012) of researchers from a Malaysian university, which boldly declares the "Hypoglycemic Effect of Honey" in the title, which soon is minimized to "reduces hyperglycemia in diabetic rats and humans"—but still both statements are false, misleading, and may hurt Type 1 and Type 2 diabetics.

The honey research keeps sticking to diabetes, either as claims of effectiveness for the treatment of diabetic wounds (Alam 2014) or as a treatment for diabetes itself (Bahrami et al. 2009). In the latter case, it is fortunate that the Bahrami study ended after eight weeks, because—as one might expect—it showed an increase in HbA1C—a measure of blood sugar levels. Honey has even been proposed as a sole treatment for Type 2 diabetes in an unethical and dangerous study in which patients "volunteered to stop the medicines and use honey as a sole treatment" (Abdulrhman 2016).

There is no special emphasis on research on apples and diabetes or oranges and diabetes. Both have sugar content

and a low glycemic index compared to honey. Why are there so many studies of honey and diabetes but not the same for apples? What's special about a form of sugar that has only a slightly lower glycemic index than sucrose? What is the secret behind honey and all those researchers?

It is notable that most honey research is by investigators who have a Muslim background—something that can be seen in the names of the researchers or the places where they're based. Fifteen out of twenty research papers in the first two pages of a recent Google Scholar search using the keywords "honey diabetes" were (a) authored or coauthored by researchers either originally or currently residing in Muslim-majority countries or belonging to universities in Muslim-majority countries; or (b) were conducted in one of these countries.

Honey simply doesn't need these research papers to be sold as treatment in many Muslim-majority countries, because it gains huge support from various holy texts in Islam (Purbafrani et al. 2014). The religious popularity of honey may also be driving the research interest. While we can't confirm that the motivation behind honey research is religious, we also can't ignore this potential conflict of interest of the researchers who almost advertise honey to the wrong audience. In addition, the University of Toronto study involves a potential conflict of interest. Two of the authors, including the lead investigator, reported receiving financial support from the National Honey Board (National Honey Board 2023) as mentioned in the "declaration of interest" section in the study.

If an adherence to religion is really behind all this, these "researchers" must know that their holy texts are making recommendations based on the limited menu available in arid regions during ancient times and that these few items should never be the sole guide for people's diets today—much less a guide to treating today's patients. More importantly, religion should not be a motivation to conduct research or write misleading study titles or conclusions that could endanger patients. Today, daily street conversations among Type 2 diabetics in Cairo, Baghdad, Islamabad, or Istanbul often reflect the same piece of pseudoscience: "Honey is good for diabetes." ■

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Omar Meriwani is a diabetic who lived in Iraq and suffered from some dangerous misinformation about diabetes. He now lives in London and manages Real-Sciences.com, the first website for scientific skepticism in the Arabic language.

Owl Overlords? Concocting Pseudoscience in the Undergraduate Classroom

CRAIG A. FOSTER

I teach a course called Psychology of Pseudoscience at SUNY Cortland. I created this course to help students understand how people come to believe unconventional scientific claims.

An ongoing challenge in this type of course involves the number of students who support different forms of pseudoscience. Undergraduates—like people generally—exhibit varying levels of support for creationism, anti-vaccination, Bigfoot, astrology, psychics, and so forth. It might be difficult for students to embrace the illegitimacy of common pseudoscientific arguments when they rely on those arguments to support their existing beliefs.

My solution is to have students develop their own forms of pseudoscience. Specifically, my midterm paper requires students to create bogus scientific claims along with plans to promote their nonsense in the public sphere. These "original pseudoscience promotions" should incorporate the psychological concepts we reviewed in class but can use additional social science principles if necessary. This approach guarantees that students review and apply pseudoscientific tactics in a cognitively safe space.

In other words, my students create fake pseudoscience. I know that *fake pseudoscience* sounds redundant, but I think the term works. Fake pseudoscience is doubly inauthentic, like intentionally making bad fruitcake.

Now, I don't have a bumper sticker that says "Ask me about my psychology of pseudoscience class," but I want to share some gems from this collection. I've had at least a couple conversations where people wanted to hear about the undergraduate-inspired foolishness. Plus, my experience with the Lilienfeld Alliance for the Teaching of Rational Skepticism in Higher Education highlights several professors who directly examine bunk in the college classroom. I would be delighted if any of them saw utility in my paranormal-promoting project.

In that spirit, here are five original pseudoscientific promotions that could, if enacted, infuse public discourse with even more harmful garbage. Student names were included with permission.

Erica Pompa claimed that eating supplemental Christmas lights improves intelligence. Pompa planned to join sham

well-being Facebook groups to learn the trade and gain social credibility. Then, a well-timed inquiry would ask followers what the government is hiding from us. Responses would be directed toward the government's efforts to conceal the intelligence-boosting benefits of Christmas light consumption: Unintelligent people are more controllable! Promotional highlights included a genuine reference to light bulb-eating Harvard students and connections between the electrical potential of lightbulbs and neural activity in the brain. Oh, and notice that a bright idea is signified by the appearance of a light bulb. (*Nice.*)

Jordan Drago claimed that eating chalk inhibits acne. Drago recognized that many people "go crazy for health fads," and acne frequently causes personal insecurity. Chalk comes from natural products and creates purported chemical reactions that reduce blemishes. Drago wisely planned to draw naysayers into the chalk-acne rabbit hole by explaining that their facts are all wrong, science has been wrong before, and they have been misled by a profit-oriented conspiracy run by the government and Big Pharma. Drago wrote, "At any turn, there will be a rebuttal." (*Heart sign.*)

Vincent Aquino claimed that untreated strep throat can generate human superpowers. To support this claim as pseudoscience, Aquino wrote: "While there is no real-life equivalent to the serum they injected Captain America with, it's safe to say it is not FDA regulated and would also kill someone." Aquino cultivated an erroneous causal link by suggesting that bacteria's ability to mutate could result in human mutation. Physicians are involved in concealing this phenomenon. Interestingly, Aquino suggested that a common human desire "to be special" could help develop this group of aspiring Avengers. (*I'm just a kid from Brooklyn.*)

Isabella Scala-Palladino claimed that lying in the dark alleviates irritable bowel syndrome (IBS). Incidentally, Scala-Palladino expressed interest in the claim because of personal struggles with misleading wellness claims as a teenager. This masterful promotional plan involved a Darkness Therapy treatment center and advertising conducted in public bathroom stalls and on social media platforms. The plan motivated potential clients toward the treatment by tying politics to the shaming of "natural body functions." Darkness Therapy received false support from legitimate science about light and circadian rhythms. The plan created intra-group reinforcement through post-treatment group debriefings and the development of online echo chambers. Scala-Palladino planned to flip the burden of proof by emphasizing science's inability to disprove the darkness-IBS claim. (*From Steve Rogers to Aaron Rogers.*)

Emalee Sickles claimed that owls are intelligent aliens who have been manipulating human history since ancient times—if not longer. This outrageous claim united pseudoscience and pseudohistory by contradicting owl biology and the known causes of historical events. The corresponding promotion was a *tour de force* built primarily on non-falsifiability and a creative interpretation of historical events *a la* ancient alien promoter Erich von Däniken. Plagues and wars were more properly understood as owl-constructed events designed to control human populations and their political climates. Sickles planned to meet anticipated criticisms with a series of *ad hoc* explanations that place the burden of proof on skeptics. For instance, owls accept captivity to conceal their nefarious plot. (*A no-holds-barred snow job.*)

Now don't hoot at me about potential harmdoing. I made it clear that the paper was only for learning purposes. My students seem too good natured to exploit scientific reasoning vulnerabilities anyhow. Instead, they seemed to have learned valuable lessons about how easy it is to promote hooey.

Even I felt like the papers gave me additional insight into the world of pseudoscience. While reading these papers, I sometimes found myself thinking, *Oh wow that could actually work.* My impression was that particularly effective pseudoscience promotions focus on the human desire for quick fixes or explanations. This vulnerability was supplemented by hand-picked anecdotes, conspiracies to explain the lack of evidence, support from irrelevant research, and *ad hoc* explanations. Online platforms provided cost-effective ways to directly promote pseudoscience and encourage pro-pseudoscience arguments among believers.

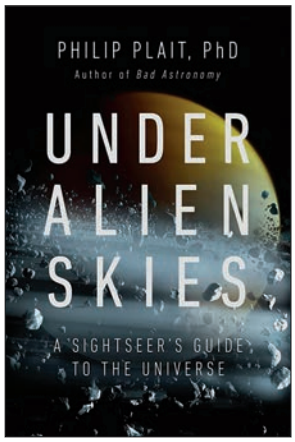
I am confident the assignment was effective. My course assessment strategy will provide some evidence for me to chew on. In the meantime, I naturally turn to this pleasing anecdote. Pompa concluded her promotion of Christmas Light–amins by writing: "I think that if someone were to actually follow through with this plan it would take a lot of time, but could eventually work. … And that is terrifyingly illuminating."

Exactly. And it's just what the owls want us to believe. ■

Craig A. Foster is a CSI fellow and the director of research and evaluation for Northshore School District in Bothell, Washington.

Sweeping Views into Alien Skies

Manfred Cuntz



Under Alien Skies: A Sightseer's Guide to the Universe. By Philip Plait. New York, NY: W.W. Norton & Company, Inc., 2023. ISBN 978-0-393-86730-5. 336 pp. Hardcover, $30.

Philip Plait, PhD, an astronomer, skeptic, and science advocate, has authored another important book titled *Under Alien Skies: A Sightseer's Guide to the Universe*. This book is a notable contribution to scientific outreach aimed at the general public as well as some professional astronomers and astrophysicists. My overall opinion about this work is distinctly positive. I only have a few very minor unflattering remarks, which are however of peripheral importance only. Plait's book is highly effective in stimulating public appreciation of the significance and beauty of astronomy, space, stars, and science at large.

Plait is also the author of *Bad Astronomy*, a book that has gained significant attention from both the scientific community and the general public for its careful discussion of a large array of misconceptions, including the popularity of astrology and claims that the moon landings never occurred.

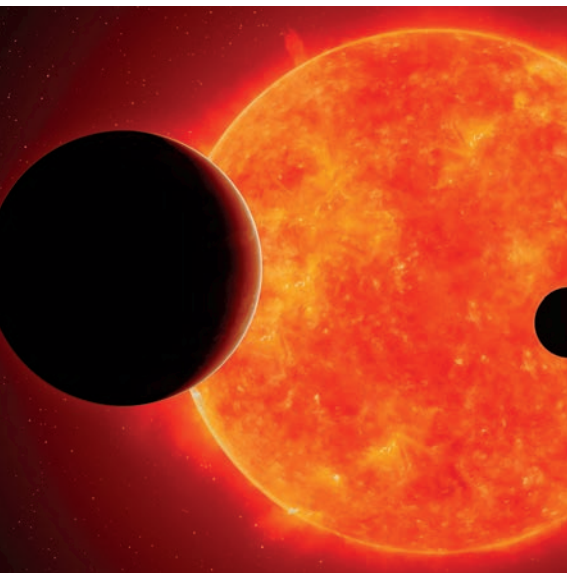
I wish to point out that it is not easy to write a book such as *Under Alien Skies* due to the complexity of astronomy as a field of science, which in the past few decades has undergone an exponential explosion driven by both new observations and profound theoretical studies. The former have been fueled by the vast lineup of space achievements, such as the Hubble and Kepler space telescopes, whereas the latter have benefited from the development of supercomputers and cutting-edge analysis techniques.

Plait handles this complexity by focusing on distinct topics, including Mars—with detailed attention to its landscape and scientific elaboration but largely disregarding Mars's habitability—and Saturn, as well as asteroids and comets. In his discussion of stars, Plait focuses on red dwarfs and binary star systems. In addition, he writes about globular clusters, nebulae, and black holes. His discussion of black holes is not restricted to pointing out their enormous gravity, including their ability of bending space-time; it also extends to the galactic relevance of black holes, including the existence of supermassive black holes at the center of spiral galaxies, including the Milky Way. Understandably, Plait also comments on black hole tourism.

Though I did not do an all-inclusive-fact-check of Plait's book, I nonetheless spotted a small number of inaccuracies, with most of them carrying little relevance. An example here is Plait's inclusion of Pluto. I applaud the many details of his discussion, including the multiple facets of Pluto's discovery and his description of Pluto's structural features, encompassing its surface, atmosphere, and satellite system. However, contrary to what is presented in the book, humans standing under Pluto's alien skies (spoiler alert: this would be a real adventure—although highly unlikely in the view of the present day's technologies!) would not stand on the edge of the solar system due to the vast space beyond Pluto occupied by the Kuiper belt, which also includes the Trans-Neptunian Objects (TNOs), and Oort's cloud. (I'm sure Plait is aware of this because he mentioned TNOs in other places.)

There are also a few examples of relatively unorthodox choices of inclusion. One example concerns planets in P-type orbits hosted by binary star systems. In these cases, the planet orbits both stars at once. Here Plait mentions the system PSR B1620-26 AB, which consists of a white dwarf and a neutron star. Those are dead stars (as also pointed out by the author) with no relevance to the "bigger picture," especially the search for life in the universe and associated topics. As a matter of fact, many other planet-hosting binary systems have been discovered, including systems comprising main-sequence stars, such as Kepler-16, with many of those previously identified as homesteads of potentially habitable exoplanets and possibly exomoons as well.

Another of Plait's potentially controversial discussions is on the topic of planets around red dwarf stars. The good news first: M-type dwarfs are highly frequent; Plait notes that they constitute about 75 percent of the phalanx of main-sequence stars. Furthermore, those stars have a very long lifespan—effectively exceeding the current age of the universe. Additionally, there is a large body of scientific studies about



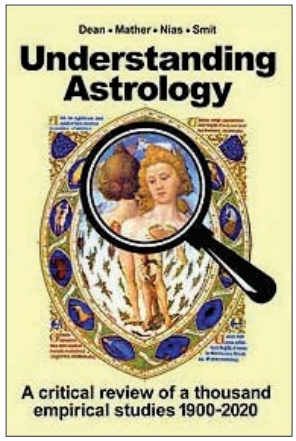
the suitability of M-dwarfs as hosts for life-bearing planets. On the other hand, more recent studies (with some of those accessible only after the publication of Plait's book) cast serious doubt on the biological appropriateness of those stars, considering that most M-dwarfs are the source of powerful flares and X-rays, which are expected to be detrimental for most forms of life. Unfortunately, this kind of analysis is also relevant for TRAPPIST-1, a star-planet system with three or four planets situated in the stellar habitable zone. However, the possibility of life on those planets is highly uncertain.

In summary, I wish to reiterate that *Under Alien Skies* is an awe-inspiring and welcoming guide to the universe. This book is of prodigious value for space enthusiasts—especially anyone who is interested in future astronomy-related developments, including those expected from the James Webb Space Telescope. I'm sure that Philip Plait will continue to focus his attention on upcoming findings in the fields of astronomy, astrophysics, and astrobiology, which have the potential to shape our understanding of the world around us. ■

Manfred Cuntz is a professor of physics at the University of Texas at Arlington (UTA), with a focus on astrophysics and astrobiology. He is the author of nearly one hundred peer reviewed publications, besides numerous contributions to public outreach, and is also a member of UTA's Academy of Distinguished Teachers.

Astrology under the Microscope

Terence Hines



Understanding Astrology. By Geoffrey Dean, Arthur Mather, David Nias, and Rudolf Smit. Amsterdam, NLD: Ain0 Publications. 948 pp. Hardcover, € 65. Available as a download for free from https://www.astrology-and-science.com/U-aino2.htm.

Most readers of this magazine probably thought that the scientific validity of astrology was settled science, with the conclusion that astrology is completely invalid. It would follow from this conclusion that research on astrology would have come to a halt. It is certainly the case that the issue of astrology's validity and its ability to predict almost anything has been settled in the negative. But the research continues. It doesn't get published in mainstream scientific literature very often, but it is published in obscure astrology journals. *Understanding Astrology* is a thorough compilation and review of that "under the radar" research, much of which is quite interesting.

Its text is divided into eleven chapters. After the introduction, chapter 2, "Personal Stories," is unusual, entertaining, and informative. Here individuals involved in astrological research tell what events shaped their views on astrology. One college student who believed in astrology was encouraged to test it in a class. In his study, people went to astrologers and gave as their birthdate that of serial killer John Wayne Gacy. Not a single astrologer informed the clients that they had the potential for great evil. This is a nice example of a creative test of astrology and a tale well told. Chapter 3 is a brief (fourteen-page) history of astrology, including the Chinese and Hindu versions. Chapter 4, "Disagreements in Astrology," covers both disagreements among astrologers and between astrologers and scientists.

Chapter 5 describes the early (starting in the 1500s) tests of astrology. The very early tests obviously didn't have the statistical sophistication of modern research. For example, an astrologer named Sixtus ab Hemminga (1533–1586) came to condemn astrology after he realized that the predictions astrology made were at serious variance with the lives of thirty well-known religious and royal persons for whom he had cast horoscopes. While he had originally believed in astrology, after his study, "I came to know it better, to be impossible, not worthy of dignity, and useless" (105).

Chapter 6 is devoted to one of the most contentious controversies in modern astrological research, Michael Gauquelin's claim to have found that the position of Mars in the sky was correlated with athletic ability among star athletes. The authors argue that the effect is real but not due to astrological influences. Rather, it is due to "social effects" by which they mean the conscious misreporting of the day and/or time of a child's birth by the

parents. The argument is both complex and convincing. The chapter is long (sixty-five pages) and rewards careful study.

Chapter 7, "Individual Studies," is by far the longest chapter in the book at 556 pages, or 60 percent of the total page count. It is here that the multitude of twentieth- and twenty-first-century studies of astrological predictions are summarized. They are arranged chronologically. The number of dependent measures investigated and the creativity of much of this research is impressive. Much of the research was carried out by astrologers, but interested non-astrologers from various scientific fields have also contributed by using the methods of their fields of research to evaluate astrology. This huge chapter is subdivided into several sections based on the types of study described or broader topics. These are "Events," "Gauquelin Topics," "Personality," and "Research Issues."

Examples will give a feeling for the wide variety of studies covered in chapter 7. Under "Events," one finds a study of whether "transits" influence marriages. In astrology speak, a transit is more than just one planet moving near a sun sign. Assume that Mars was in Cancer when a person was born. If at some future date Mercury moves through Cancer and comes near to where Mars was when the person was born, it is said that Mercury transits Cancer. There, so now you know. Anyway, in 1944, an astrologer collected relevant data (from *Who's Who*) on 1,000 marriages and "calculated the angular separation on the marriage date between … all transiting planets" (434)—except for Neptune, for unclear reasons. This took the author an incredible eighteen months of work because, in 1944, neither computers nor calculators were available. Nonetheless, the results were negative.

Does Saturn influence the weather? Another study asked this question—apparently there is some thought in astrological circles that the plants can influence meteorological variables. A 2010 doctoral dissertation concluded that it does because, among the mass of comparisons made in the study, one showed that temperatures dropped during a period of time as predicted by the Sun-Saturn cycles. However, the authors of the book note that another finding, an unpredicted warming, "escaped comment, possibly because the indicated warming was contrary to tradition" (491).

Are the astrological charts of people with a substance use disorder different from those without a substance use disorder? No, but several studies of this issue have been done and are described along with critiques when the authors of the studies claimed that their results showed a relationship when they did not. This is an especially useful characteristic of the book. Studies are not just described but are critiqued. Where authors have made logical, methodological, or statistical errors, these are noted. Some of the studies summarized, as well as some of the authors' critiques, use sophisticated statistical analyses.

While chapter 7 described and discussed each test of astrology individually, chapter 8, "Overviews," discusses tests by topic, such as tests of sun signs, tests of matching horoscopes to personality test results, and even "tests of angular planets vs. appearance." The latter is a sort of astrological phrenology where the claim is that astrological features are correlated with physical characteristics of the human face. Who knew? The chapter also covers statistical issues and concludes that there is no evidence that astrology has any validity. Those few tests that seem to support astrological predictions can "be explained by knowledge of serious astrology biasing the results." The authors predict that "astrologers will no doubt see this conclusion as confirming the inability of critics to open their closed mind" (862). Chapter 9 concerns artifacts that lead to belief in astrology, such as reliance on personal experience, confirmation bias, seeing patterns in random noise, and the representativeness heuristic, among others.

Chapter 10, "Future of Astrology," is a short chapter at sixteen pages. This is appropriate because the large corpus of studies reviewed in this book show that astrology has no empirical foundation. So, of what use can it be? Some astrologers resort to using it as a basis for counseling. But the authors wisely note that "Astrology by itself is not counselling. People with problems need to learn coping skills, but this will not happen unless the astrologer is properly qualified" (896). Unlike a real science that has a future in which new questions will be raised, astrology has no similar future. Astrology will remain a stale and stagnant belief system maintained by the well-known cognitive processes that allow people to preserve their beliefs in invalid systems in the face of contrary evidence.

Chapter 11, "The Case for and against Astrology," is the shortest (twelve pages) in the book. It is not a chapter that summarizes the relevant evidence, which was done in chapter 8. Rather, it approaches the issue from a broader perspective that asks whether astrology can be seen as a belief system that can function and be beneficial even though it is scientifically invalid. In this regard, the authors quote architect Mimi Lobell, writing in *Science News* (1975, 108, 223) whose comment is typical of defenders of astrology: "Astrology offers people what science does not: a psychologically meaningful link between the individual and the cosmos." The problem here is the phrase "psychologically meaningful." Of course, almost any belief system can be psychologically meaningful for those who accept it. That fact should not be seen as a case for the objective validity of that system. There is almost nothing positive to be said for astrology.

To say that *Understanding Astrology* is comprehensive is an understatement. It covers every aspect of Western astrology that I can imagine (well, okay, there is no section on "astrology in philately") in clear and concise detail. It took a huge amount of work to compile the information in the book. The coverage is not limited to material published in English. The text is extensively illustrated with reproductions of diagrams and figures from the publications discussed. Also delightfully included are copies of relevant book covers, artwork, and amusing cartoons. In short, it is the definitive work on the status of astrology. ■

Terence Hines is professor of psychology at Pace University and author of *Pseudoscience*

Skeptical Inquirer
THE MAGAZINE FOR SCIENCE AND REASON
Special Issue:
Medical Pseudoscience around the World
Homeopathy Research in Europe Hits New Low
Ayurvedic Medicine on the Rise in India
Medical Misinformation in Hungary
Plus:
The Carolina Lizard Man
Harriet Hall (1945–2023): Her Final Column
More Remembrances of Kendrick Frazier

Scientific Contagion

In the article "Scientific Contagion Spoils the Magic of Religion" (May/June 2023), Stuart Vyse looks at the principles of similarity and contagion and cites experiments with dog poop–shaped chocolate, water that had been briefly in contact with a sterilized cockroach, and a shirt previously worn by a disliked person as evidence of the prevalence of these principles in the subconscious thought, feeling, and perception of even educated individuals.

But there is another complementary, partial explanation. In studying acting, one is encouraged to use "sense memory" and "emotional memory" to enhance the quality and realism of one's performances. And everyone forms sense and emotional memory even without this encouragement. While, for example, being invited to taste or tasting the chocolate, one may involuntarily draw upon one's sense memories of dog poop, which may somewhat spoil the experience, and likewise for the other two cases.

This does not in any way detract from the excellent article, which brings a great deal of other evidence to bear, but perhaps weakens this one argument.

Tom Marlowe
Rahway, New Jersey

Stuart Vyse responds:

Tom Marlowe makes an interesting point about sense memory and emotional memory, but these terms did not make their way into my column because, as he suggests, they are largely limited to the field of acting and are not yet the subject of scientific study. Psychologists who study memory have identified "sensory memory" and "affective memory," but these concepts refer to very different phenomena than the theater terms. Nonetheless, Marlowe's suggestion might represent a good hypothesis for possible future investigation.

The Fallacy Game

I very much appreciate Massimo Pigliucci's article "The Fallacy Game," (May/June 2023) just as I also appreciated Maarten Boudry's 2017 article on the same subject.

It is not so simple that you can point out a "logical fallacy" (often with a fancy Latin name) in your opponent's reasoning and thus think that you have gained an advantage. No, your opponent would almost certainly say that you misunderstood him/her, that the "fallacy" does not apply in this case, or that you misapplied it, etc., and you will have great difficulty in convincing anyone that your application of the "fallacy" was meaningful.

For me, it was sometimes the other way around: someone tried to claim that I was guilty of one or more "logical fallacies," but I found their reasoning unconvincing.

So, Pigliucci and Boudry are right: talking about "logical fallacies" doesn't work in the real world!

Erland Gadde
Karlskoga, Sweden

Mr. Pigliucci's article on fallacies was excellent. But it got me thinking. There is a fallacy that I believe is not included in the standard lists. For lack of anything better, I call it "assumed binary choice." There is a fatal flaw in your argument, so my position must be right.

This implicitly assumes that there are only two possibilities. But without further support, the argument is incorrect.

Ancient Greeks may have believed that a statement must either be true or false. But we now have Qubits, statements such as "This statement is false," that indicate that even in logic there can be more than two possibilities.

Is there a name for the logical fallacy I am calling "assumed binary choice"? Like the problems Pigliucci points out so well, the belief that there are only two possibilities must be justified. It can't just be assumed.

Patrick J. Russell
Seattle, Washington

I find it amusingly ironic that the initial argument against calling out logical fallacies in "The Fallacy Game" was an appeal to authority: "But the little-known fact is that argumentation theory moved beyond the notion of logical fallacies decades ago because it is deeply flawed, not very useful, and—as far as skeptics are concerned—a double edged sword." To be fair, after the initial statement the author does distinguish, for instance, between using an appeal to authority as a proof of a statement versus using it as evidence in support of a position. Where I diverge from the author is in the claim that the credulous and skeptics are alike in using these arguments as evidence instead of proof and the hope that focusing on the assumptions and causal connections may lead to a resolution of the disagreements.

What I have found is that while most people are very good at seeing patterns, many do not have the logical or analytical skills to determine when a pattern is not, or need not be, causal. When I told a friend that merely looking at the number of deaths after COVID-19 vaccination did not show that the vaccination was responsible for the deaths, they disagreed and repeated the claim (*post hoc ergo propter hoc*). When I replied that you needed to subtract out the expected number of deaths for people who hadn't been vaccinated, they said they didn't understand my argument, and it didn't make sense. When I tried giving examples, including how to figure out if a die was fair, I was told my argument was too complicated, and besides all the data was rigged. When I pushed back that it was the data on which his source based its analysis, I was told that the CDC was biased, Robert F. Kennedy Jr. showed that vaccines don't even work, and that it was all a plot by Bill Gates and the economic elites to control people. Eventually, my friend was back to simply asserting that the COVID-19 vaccines kill people. I have had similar but much less extensive interactions with people on the internet. I have not had this kind of interaction with skeptics, which makes me suspect that it is less common.

A common, and I suspect critical, factor in these discussions is trust in oneself, groups, and organizations. My analyses and beliefs align with the views of the biased mainstream media and dishonest government agencies that have been captured by greedy pharmaceutical companies and are therefore wrong. I was able to talk my friend out of a belief in chemtrails, but I suspect that was partly because it is not a common topic in the mainstream media and because I found an article by another blogger who showed that there was data on the first blogger's website that had got him excited and contradicted the blogger's claim.

I argue from authority when it's a subject about which I know little, but my choice of authority is strongly biased toward the majority opinion of people who study or are familiar with the subject. This does not guarantee that I will be right, but it does improve my odds. Quantum mechanics and relativity are obviously nuts—but I accept them anyway. The opposite of this bias toward expertise and a majority opinion appear to be a very common trait of those who are prone to conspiracy theories and misinformation.

If the subject catches my interest, I take the time to examine and analyze information on the subject. My friend, and many

like him, do not have this option because their analytical skills are missing, and because anything that agrees with mainstream media or other such sources must be wrong.

I do not think my friend's attitude and condition is that uncommon. I do not share the author's belief that epistemic bullying is a major issue and that we have much hope to change minds by merely trying to discuss the underlying assumptions that people make. His sample is undoubtedly different than mine, but what he sees as epistemic bullying I see as a frustrated response to the inability to move the discussion from a discussion based on emotions to one based on reason. I think it is unlikely that I as an individual will have much luck changing someone's mind about issues such as vaccination safety when social media amplifies fear and distrust of it. Getting past the emotional response is so difficult that we have seen stories of people literally denying that COVID-19 was real or that vaccinations work while on their death beds.

Robert Clear
Berkeley, California

Massimo Pigliucci responds:

Erland Gadde's point is excellent: "the other side" has now learned to play the fallacy game as well, so when a skeptic says, for instance, that a climate scientist is a good source of information about global warming, the denier replies "Gotcha!" and quickly moves on. That right there should be a cautionary note about the inefficacy of calling out fallacies.

If I understand Patrick Russell's comment correctly, he is talking about the fallacy of false dichotomy, which describes situations in which someone claims that only two options are on the table while in fact there are other possibilities. One doesn't need to go outside of classical logic to recognize the problem, though of course it is made more evident when we move to multimodal logic.

Regarding Robert Clear's comments, I'm not sure we disagree that much. Yes, I began the essay with the "fallacy" of appeal to authority, but I then immediately explained why in several circumstances it is not, in fact, fallacious. I'm betting Clear himself goes to a dentist if he has a toothache, and that's because he recognizes that dentists are the proper domain-specific experts when it comes to toothaches. He is, incidentally, right when he brings up the issue of trust. My next column in Skeptical Inquirer *is, in fact, precisely about that issue.*

I don't think I claimed that the skeptics and the credulous are on the same level, though how frequently each group indulges in "gotcha!" fallacy games is of course an empirical question to be settled by way of data. I am simply concerned with the intellectual honesty of our side and would like to remind people that persuading others is a complex and often frustrating business that cannot be reduced to pasting a link to "your logical fallacy is …"

The interaction with a denier that Clear describes is, I think, rather typical. Aristotle pointed out two crucial things to keep in mind when dealing with such people: First, remember that persuasion is not just a matter of good reasoning (logos) but also of having credibility with the other person (ethos) and of engaging them at an emotional level so that they care (pathos). Second, it is fruitless to engage in discussions with people whose starting assumptions are too divergent from ours. We just need to get away from the naive notion that simply because we are (hopefully) right, others will see the light as soon as we shine it on them. That's not how the world works.

Homeopathy Research

Last night I finished reading the article by Norbert Aust and Viktor Weisshaupl in the May/June issue of SI titled "Homeopathy Research Hits a New Low." I loved it. I have been a peer reviewer for several journals and conferences over a long career and have found that many colleagues skip the analysis section of a research paper because, despite having taken statistics in their graduate programs, they remain frightened of analyses.

Now that I am retired, I content myself with editing dissertations linguistically and technically, and the errors are appalling. It appears that major professors no longer have the time (or desire) to do these reviews. The students have completed six graduate credit hours of statistics and an equal number of credits in research design, but when I ask them simple questions, they uniformly act as if I am speaking a foreign language. In one instance, I asked a student what s/he was going to use as a control, and their response was: "What's a control?" In another case, a student had a much larger initial group than at the end of his study. Given the disproportion, I suggested a nonparametric test of significance rather than a parametric one, and s/he had no idea what these terms meant.

I am truly fearful for the next generation of researchers and the quality of their work.

M. Bennet Broner, PhD, MS
Homewood, Alabama

I found Aust and Weisshaupl's article puzzling. First, there is no description of the "treatment" applied to the cancer patients. Was it some sort of "magic beans," or what? On the second page, the authors state that homeopathy does not make sense because "the medicines are so diluted" that there is no active ingredient. Simple math shows that the medicine would not have a detectable amount of "medicine" when compared with water (or other dilution medium). That would seem the end of it—a simple notice that another bogus claim was made, report, and move on.

But the authors are clearly concerned about discrediting the study because it was published in a more mainstream/professional journal. Examples of journals containing truly fake information have been around for years simply pranking the whole research field. I would liken this to "putting lipstick on a pig." It's still a pig!

Stretching this to eight pages seems like overkill, considering your mission to promote real research and education. Back in the 1990s when I first subscribed, it seemed that homeopathy was done and decided as bunk—the same sort of bunk presented by "flat-earthers" and "ghost chasers."

It's disappointing to see the Skeptical Inquirer do this presentation of statistics and other analysis to evaluate a concept that has, for decades, had no legitimate standing in scientific research.

Dane Tovey
San Diego, California

Norbert Aust and Viktor Weisshäupl respond:

First, we want to thank Dane Tovey for his comments on our article in the May/June 2023 issue of Skeptical Inquirer. *We share his views that homeopathy has long since been proven to be a mere placebo treatment at best, but in the way it is promoted to patients even for very severe conditions, one could consider it fraud.*

Unfortunately—and this is what we wanted to bring to readers' attention—it is still alive and kicking and is about to build an evidence base that looks convincing to the patient not familiar with clinical studies and statistics. We find that just this mindset, "everybody knows homeopathy is nonsense, so let us simply ignore any such rubbish papers" prepares the ground for undermining our scientific database. Just consider how the scientific community and institutions altogether failed to expel this fake study. How can we argue with any individual that homeopathy is what it is when anybody can wave this paper into our faces together with a few others as perfect scientific proof of effectiveness.

Our main object was to show how the authors did it, what methods were used to make their study

look perfect, and how easily any peer reviewer could have spotted the discrepancies between registration and final paper. This is what study registrars were made for. In addition, we showed what effects could be produced by the manipulations that were applied. In fact, we do not understand how a study like this could make it into any respectable journal or how it is able to maintain its position there despite the efforts of quite a few individuals and organizations to have it retracted.

In a nutshell: This article was not aimed at the skeptic who already is convinced once and for all that homeopathy is bullshit and has other interests to follow in the skeptical universe. We look for support to prevent homeopathy's further spread into the real science realm—and tried to deliver a full load of arguments and background information. We also wanted to pinpoint how a respectable medical journal with an allegedly functioning peer review can fail in detection and timely elimination of a study produced by scientific misconduct.

Political bias in Skeptical Inquirer

I live in Australia. I am not a registered Democrat or Republican. I am a contributor to SI, but despite letter writer Paul Kelly's claims (May/June 2023), I am neither a college instructor nor a "liberal Democrat hovering on the far-left fringe of reality."

As therefore a relatively disinterested observer, I must defend SI against Kelly's claims of political bias.

The references to Donald Trump that Kelly takes umbrage at have nothing to do with his politics. It is clear to most of the rest of the world—and we have had incessant exposure to evidence of this through the international media—Trump is a narcissistic simpleton and unfit to hold public office.

Regarding "his odious acolytes," they are not odious because they are Republicans. They are odious because they are either such horrendous judges of character that they cannot see this or, more likely, their political bias makes them willing to fawn at the feet of a man with the worst personality in public life. Note the totally disparaging published assessments of him among prominent Republicans in 2015/2016 versus today.

SI's contributors would be negligent and would lose much more credibility if they ignored the overwhelming evidence of Donald Trump's deficiencies for the sake of a political balance that is irrelevant to the above facts.

Gary Bakker
Tasmania, Australia

Who's on Team Science?

In the January/February 2023 SI, I authored an article titled "The James Webb Space Telescope: First Responses from Religion." This article sparked two letters to the editor published in the May/June 2023 issue from Glenn Branch and Linda Ferrazzara. I concede that I sadly missed the allusion to the rock band Panic! at the Disco regarding the word *panic*'s use in the title of the April paper by Ferreira et al.

However, especially the latter letter appears to indicate a quasi-equidistance regarding the sub-ideal comments by Ken Ham and me. Admittedly, I was a bit quibbling about the paper's title—a choice that supposedly should reside with the authors. However, Ken Ham took a fundamentally different approach. Through quote mining, he focused on the basics of Ferreira et al.'s work—essentially saying that the authors are in panic because there are possible incompatibilities between their results and the existence of the Big Bang, an assertion that is of course incorrect.

In short, I'm profoundly convinced that G. Branch, L. Ferrazzara, and I are playing on the same team in defense of science, whereas Ken Ham aims to discredit science.

Manfred Cuntz
University of Texas at Arlington
Arlington, Texas

Allison DuBois, Psychic

Will you please consider doing a feature on or an interview with Allison DuBois? She is the most gifted and tested psychic medium in our world today. The next step in human evolution. Thank you very much!

Nancy Traynor
Rutland, Vermont

Stuart Vyse responds:

In the July/August 2011 issue of Skeptical Inquirer, we published "Medium Allison DuBois Is Tested–and Fails–in the Real World" by Ryan Shaffer. After Shaffer examined DuBois's accuracy in the context of two real cases, his view of DuBois's abilities was quite different from yours: "although the character of Allison DuBois on CBS's Medium solves crimes by using psychic ability, evidence for DuBois's ability in the real world is sorely lacking" (16).

Ten Health and Wellness Fallacies

Kudos to Nick Tiller for his article "Ten Health and Wellness Fallacies Every Skeptic Should Know" in the March/April 2023 issue. Most notable is his warning that "marketing companies understand our biases better than we do."

Apropos of this warning, I regularly watch a TV station that has been deluged for months by one company with ads for "fruits and veggies" in bottled pill form that claim remarkable health benefits. Each ad is filled with heartfelt testimonials (fallacy of observational selection) from alleged customers and physicians (argument from authority) who claim substantial health improvements after taking these pills (*post hoc* fallacy). The alleged health benefits are always described in vague general terms such as "I feel so much better" or "I have more energy," making them, of course, unfalsifiable. It's a slick low-key presentation. And how can you go wrong with "fruits and veggies"? *Caveat emptor*!

Len Geller
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Erratum

Several readers pointed out that we incorrectly identified the birds shown in the photo by Kendrick Frazier on page 56 of the May/June 2023 issue. They are cranes, not geese.

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